

BIBLIOGRAPHY AND INDEX OF
HYPERVELOCITY IMPACT MECHANICS

Robert F. Smiley

Final Technical Report No. ARA 327-8

30 June 1967



BIBLIOGRAPHY AND INDEX OF
HYPERVERLOCITY IMPACT MECHANICS

Robert F. Smiley

Final Technical Report No. ARA 327-8

30 June 1967

Prepared For

Contract No. NASw-1378

National Aeronautics and Space Administration
Washington, D. C.

ALLIED RESEARCH ASSOCIATES, INC.
VIRGINIA ROAD • CONCORD, MASSACHUSETTS

ABSTRACT

An extensive indexed bibliography is presented, covering primarily the subject of experimental and theoretical information on the mechanics of penetration of structures by hypervelocity projectiles. Also included is a limited coverage of information on the meteoroid environment and on design considerations for the meteoroid hazard.

FOREWORD

The research reported herein was performed as part of a general study of structures and materials design synthesis for space and launch vehicles, performed for NASA, Washington, D. C., under Contract No. NASw-1378. The particular scope of the investigation covered by this report consisted of a preliminary survey of the field of hypervelocity impact mechanisms and the associated damage to spacecraft elements, made with the initial view of assessing selected aspects of the state-of-the-art of design for meteoroid damage and to ascertain areas requiring further investigation. In the course of this study it was found that many of the subject areas on this field which were considered had been previously reviewed and that these previous reviews had not yet become out-of-date to any appreciable extent. Consequently, rather than repeat the content of these reviews, the results of the present study are presented herein primarily in the form of a classified index of existing reviews, data and analyses, plus an extensive bibliography.

ACKNOWLEDGMENTS

The writer is grateful to Mr. Peter Kyle of Allied Research for his substantial support of the present investigation, and particularly for information on metallurgical aspects of the hypervelocity impact process.

TABLE OF CONTENTS

	<u>Page</u>
ABSTRACT	ii
FOREWORD	iii
ACKNOWLEDGMENTS	iv
INTRODUCTION	1
INDEX OF HYPERVELOCITY IMPACT INFORMATION	2
1. Reviews of High Speed Impact Phenomena	2
1.1 General Reviews	2
1.2 Restricted Short Reviews	3
2. Bibliographies	3
3. Hypervelocity Impact on Thick (Semi-Infinite) Plates	5
3.1 Experimental Studies (Including Short Semi-Empirical Studies)	5
3.2 Extensive Analyses or Correlation Studies	5
3.3 Scaling Considerations	5
3.4 Theoretical Studies Made with Detailed Hydrodynamic Codes	5
3.5 Other Theoretical Studies	6
3.6 Peak Pressure Studies	7
3.7 Impact of Thin Rods and Jets	7
3.8 Oblique Impact Phenomena	7
4. Hypervelocity Impact on Single Finite Plates	7
4.1 Threshold Penetration Studies	8
4.2 Experimental Studies of Impact Phenomena	8
4.3 Theoretical Studies Made with Detailed Hydrodynamic Codes	8
4.4 Other Theoretical Studies	8
4.5 Impact of Thin Rods	8
4.6 Spallation (Scabbing)Phenomena	8
4.7 Spray Phenomena	9
4.8 Oblique Impact Phenomena	9

TABLE OF CONTENTS (Continued)

	<u>Page</u>
5. Hypervelocity Impact on a Thick Plate Shielded by a Thin Bumper	9
6. Hypervelocity Impact on Multi-Sheet or Complex Targets	9
6.1 Impact on Liquid Filled Containers	9
6.2 Impact on Combustible Materials	10
6.3 Impact on Tubular Structures	10
7. Impact of Liquid Drops on Liquid Surfaces	10
8. Fundamental Research in Solid Mechanics	10
9. Equations of State and One-Dimensional Shock Phenomena	11
10. Hydrodynamic Code Methods	11
11. Impact Flash and Ionization	11
12. Explosive and Nuclear Cratering Phenomena	11
13. Metallurgical and Microscopic Considerations in Hypervelocity Impact	12
14. Thermal Considerations in Hypervelocity Impact	12
15. Meteoroid Environment and Design Consideration	12
BIBLIOGRAPHIC FORMAT	13
ERRATA	13
APPENDIX A COMPLETE BIBLIOGRAPHIC LISTINGS ARRANGED ALPHABETICALLY BY AGENCIES	14
APPENDIX B ABBREVIATED BIBLIOGRAPHIC LISTINGS ARRANGED BY SUBJECT MATERIAL	40
APPENDIX C ABBREVIATED BIBLIOGRAPHIC LISTINGS ARRANGED ALPHABETICALLY BY FIRST AUTHOR'S NAME	54
APPENDIX D ABBREVIATED BIBLIOGRAPHIC LISTINGS ARRANGED IN NUMERICAL ORDER	61

INTRODUCTION

The present report is intended to serve primarily as a guide to literature in specific areas of the hypervelocity impact field, for investigators already familiar with the elementary aspects of this field, such as is given by most of the references cited in Section 1.1 of this report. In particular, the recent extensive review by Cosby and Lyle (1172*) offers a good introduction to many topics considered herein.

The design of spacecraft for long-duration missions in space requires protection of the spacecraft from the damaging effects of the ambient meteoroid environment. Furthermore, since the range of meteoroid speeds (11-73 km/sec or 33,000-240,000 ft/sec) lies largely beyond the reach of most present hypervelocity impact experimental facilities (up to about 16 km/sec or 53,000 ft/sec), the problem of design for protection against the meteoroid hazard cannot now be resolved by experiments alone. On the other hand, various theoretical approaches to the hypervelocity impact problem do exist, which permit either direct calculation of meteoroid damage for the highest impact speeds expected or which permit extrapolation of lower-speed impact tests to higher speeds by means of various scaling laws. Unfortunately, however, some of the best available theories yield some substantially different conclusions regarding both qualitative and quantitative aspects of the impact process.

In view of this situation, the spacecraft designer cannot now design for meteoroid protection with a high degree of accuracy, by either experimental or theoretical means. Hence, the best that the designer can do is to examine the most relevant theoretical and experimental evidence, and select a conservative approach in areas where disagreement of prediction methods exists. The present report is intended to aid the designer in selecting current relevant material for this purpose.

The subject material covered by this report is restricted largely to a comprehensive listing of literature on the penetration mechanics problems of hypervelocity impact. Also considerable literature, but by no means a complete coverage, is indicated on the subjects of the nature of the meteoroid environment and on specific or proposed design considerations. No consideration is given herein to reports dealing solely with experimental methods of propelling projectiles to hypervelocity speeds.

* Numbers in parentheses refer to the references in the bibliography contained in Appendices A through D and listed in numerical order in Appendix D.

INDEX OF HYPERVELOCITY IMPACT INFORMATION

This part of the report consists of a listing of each topic considered in the present study, some brief comments on significant contributions to these topics in the literature, and a reference to the section of Appendix B where a listing of relevant literature is presented.

1. Reviews of High Speed Impact Phenomena

In recent years a large number of review articles have appeared, which deal with various selected areas of the hypervelocity impact problem. This section briefly indicates the scope of some of these reviews.

1.1 General Reviews

In 1959, Rieder presented a survey of spallation literature, including a bibliography of 97 items with extensive abstracts (1145). A subsequent review of some aspects of the spallation problem was made in 1964 by Butcher et al.(1146).

In 1960, Kolsky reviewed the subject of propagation of stress waves in viscoelastic solids (1207) and Hopkins and Kolsky (103) reviewed the subject of the mechanics of hypervelocity impact of solids.

In 1963, Goldsmith reviewed the state-of-the-art on the subject of the impact of solids (1159).

Several good semi-technical introductory articles to the subject of hypervelocity impact mechanics were provided by Charters (32) in 1960 and Kinslow (1007) in 1965.

A recent book, completed by Kornhauser in 1962, on the general subject of structural effects of impact (1053), contains state-of-the-art reviews of the subjects of the meteoroid population, hypervelocity impact effects, and meteoroid effects on space vehicles.

In 1961 and 1963, Herrmann Jones and Polhemus performed a comprehensive review and correlation of existing theoretical and experimental information on the hypervelocity cratering and penetration process (438, 1095).

In 1962, Eichelberger and Gehring reviewed the state-of-the art of information on the mechanism of crater formation in hypervelocity impact (1017).

In 1963, a review concerned primarily with the Rand Corporation's contributions to the subject of hypervelocity impact mechanics and their relationship to experimental observations was performed by Bjork (580).

In 1963, Ali (1042), Davidson et al. (463), and Maiden (404) reviewed to some extent each of the three topics of the meteoroid environment, hypervelocity impact mechanics and protective design methods. More recent reviews in these same subject areas were made by Gehring et al.(1068) and Charters et al. (1235) in 1964.

The recent extensive review of the meteoroid environment and its effects on materials and equipment by Cosby and Lyle (1172) offers a good introduction to and survey of many aspects of the meteoroid hazard problem, including the meteoroid environment, hypervelocity impact phenomena, and protective design considerations. This review, published in 1965, provides a good coverage of information published up to approximately mid 1964.

In 1966, Zukas reviewed information on the subject of strengthening of metals by high-pressure shock loading (1089).

Eichelberger has presented a useful summary of theoretical and experimental studies of crater formation presented at the Sixth Symposium on Hypervelocity Impact in 1963 (1016), which is particularly interesting for its critical appraisal of the present state-of-the-art of "hydrodynamic code" methods for hypervelocity impact calculations.

1.2 Restricted Short Reviews

In addition to the rather extensive review articles discussed above, there exist a number of useful short or specialized review articles, which are listed in Section B. 1.2 of Appendix B. For the most part, these articles represent introductions to or summaries of sessions of the various symposia on hypervelocity impact.

2. Bibliographies

There exist a large number of bibliographies of material relating to different aspects of the hypervelocity impact problem, including the subjects of the meteoroid environment, equations of state, general impact phenomena, and dynamic hardening of materials. A selection of useful bibliographies in this class are listed in Section B. 2 of Appendix B and are briefly commented on below. Additional useful bibliographies are contained in most of the general review articles discussed in Sections 1.1 and listed in Section B. 1.1.

The Battelle Memorial Institute has recently prepared an extensive listing of approximately 1200 sources dealing with hypervelocity impact information (1246), plus a brief preliminary survey and listing of literature on the hypervelocity-impact properties of plastics and plastic laminates (1020).

The Lockheed Missiles and Space Company has issued a series of bibliographies on the meteoroid hazard and impact mechanics (e.g., 1085), plus an annotated indexed bibliography of 132 entries on shock wave propagation in solids (1086), which includes effects of explosive blast waves and/or hypervelocity impact on plastic, viscoelastic and elastoplastic solids.

The NASA Marshall Space Flight Center, in cooperation with the Redstone Scientific Information Center of the Army Missile Command, has issued a bibliography of 876 entries with abstracts (457), concerning the subjects of hypervelocity impact and the meteoroid hazard, with listings arranged according to the following categories: Part A - hypervelocity impact: surveys of the experimental data, vehicle protection analysis, theoretical studies, experimental investigations, experimental facilities, proceedings of symposia, and author index; Part B - meteoritics: flux determination, experiments and instrumentation, theoretical studies, and author index.

As a part of a recent survey of the meteoroid environment and its effects on materials and equipment, Cosby and Lyle (1172) have presented a listing of 321 related references, including a substantial coverage of significant reports on hypervelocity impact mechanics.

The list of references contained in the two survey report by Herrmann et al. (438, 1095) provides a bibliography of 637 entries dealing with the hypervelocity impact process.

The Aerospace Technology Division of the Library of Congress has issued a series of reports comprising a bibliography with abstracts of Soviet Bloc publications, dealing primarily with problems of hypervelocity impact, non-nuclear explosions, and high pressure shock wave phenomena in solids. It should be noted that the material reviewed in this report series is much more concerned with hypervelocity impact phenomena than the title of the report series ("Nuclear Weapon Effects") would suggest.

3. Hypervelocity Impact on Thick (Semi-Infinite) Plates

A considerable fraction of the total work done on the problem of hypervelocity impact has been concerned with the special case of the impact of projectiles upon targets of sufficient thickness such that the produced cratering action is independent of the target thickness. This section considers the available experimental and theoretical information relevant to this problem.

3.1 Experimental Studies (Including Short Semi-Empirical Studies)

Section B. 3.1 of Appendix B presents an extensive (but by no means complete) listing of papers including experimental results of hypervelocity impacts into thick or semi-infinite targets. The listed papers by Herrmann and Jones (1092) and Bouman and Burkitt (1090) contain particularly extensive compilations of data on crater characteristics.

3.2 Extensive Analyses or Correlation Studies

Section B. 3.2 of Appendix B presents a listing of papers concerned primarily with correlation of experimental cratering data with theory or with correlation of crater data by semi-empirical or empirical procedures. (See also listings in Section B. 3.1 for various less comprehensive correlation studies.)

3.3 Scaling Considerations

In addition to the correlations of theory and experiment and analyses mentioned above, many investigators have established theoretical or semi-empirical scaling laws which permit some limited extrapolation of existing experimental cratering data to higher velocity impact conditions and to other projectile and target materials. (See listings in Section B. 3.3 of Appendix B).

3.4 Theoretical Studies Made with Detailed Hydrodynamic Codes

Several groups of investigators, following the approach originated by Bjork (128), have analyzed the hypervelocity impact and cratering process (or at least the first stages thereof) under the assumption that, for sufficiently large pressures compared to material strengths, the impact process can be considered a purely hydrodynamic process. These investigators have developed several detailed computer programs for solving these hydrodynamic equations, and have applied them to prediction of crater

size and other characteristics for the impact of projectiles into semi-infinite targets (see listings in Section B. 3. 4 of Appendix B). A review of the present status of information derived from these "hydrodynamic code" solutions has been recently performed by Eichelberger (1016).

3. 4. 1 Extensions of Hydrodynamic Theory to Include Material Strength

Insomuch as many investigators believe that the late stages of the hypervelocity impact process depend strongly on the strength or hardness and viscosity characteristics of the target material, there have been efforts by Dienes, Herrmann, Riney, and others (see Section B. 4. 1 of Appendix B) to extend "pure hydrodynamic" codes by introduction of viscosity considerations, in order to include some realistic simulation of material strength. So far these efforts have resulted in the development of at least one computer code incorporating such material strength effects (1056) and limited runs with this program have indicated that material strength does not significantly alter hypervelocity impact characteristics for pressures in iron or aluminum down to about 0.3 megabars (1056, 1058). For pressures below about 0.2 megabar, this computer program became less accurate and is currently being revised to permit more accurate application to lower pressure regimes.

It should be noted that the above-mentioned modified hydrodynamic theories contain the assumption of an isotropic target medium thereby implying that symmetrical impacts produce symmetrical craters. There is, however, some experimental evidence that hypervelocity or explosive craters may produce markedly unsymmetrical craters, particularly for the impact of projectiles small enough to impact upon a single crystal of a target (1079, 1175). For this case, some crater boundaries have been observed that clearly follow the natural crystalline structure of the target material. Fitzgerald (1079) has presented some unconventional views regarding possible explanations and predictions of this phenomena.

3. 5 Other Theoretical Studies

Section B. 3.5 of Appendix B presents a listing of other recent theoretical papers dealing with the problem of high-speed impact of projectiles into semi-infinite targets. Many of these papers and some earlier significant papers have been recently reviewed by Herrmann and Jones (438, 1095) and Cosby and Lyle (1172).

3.6 Peak Pressure Studies

The peak axial shock pressures generated below the center of impact for a hypervelocity projectile are of interest for prediction of types of target damage such as spalling or metallurgical changes in regions below the visible crater. These pressures can, of course, be directly calculated theoretically as a part of detailed hydrodynamic code solutions, but this is an expensive and not necessarily an accurate choice because of the inherent limited resolution of present computer codes. To relieve this situation, Heyda and Riney have developed a simplified theoretical approach to deal with this problem, which permits estimates of peak sub-crater pressures for a similar-material impact (1050), unlike-material impact (1051) and for the impact of sub-normal-density projectiles (1052). Peak pressures computed by this simplified method have been found to be in good agreement with the results of detailed hydrodynamic code solutions (1050).

Only a little experimental evidence is available on the variation of peak pressure below hypervelocity impact craters in thick targets. Kyle and Gerard (1004, 1005) have presented pressure-depth variations for several impact craters, deduced from microhardness measurements and known shock-hardening relationships. Charest (1060) has developed an experimental throw-off-pellet technique for measuring peak pressures and has obtained some test data in agreement with predictions of the detailed hydrodynamic code solutions by Heyda and Riney and by Tillotson.

3.7 Impact of Thin Rods and Jets

Section B. 3. 7 of Appendix B presents a listing of papers dealing with theoretical and experimental studies of the impact of thin rods and jets into semi-infinite targets.

3.8 Oblique Impact Phenomena

Papers dealing with experimental and theoretical studies of oblique hypervelocity impact into semi-infinite targets are listed in Section B. 3. 8 of Appendix B.

4. Hypervelocity Impact on Single Finite Plates

Much recent work on the problem of hypervelocity impact has been concerned with the case of penetration of hypervelocity projectiles through single finite plates, including the topics of threshold penetration (ballistic limit), target perforation characteristics, the spallation process, and spray characteristics. This section considers the available experimental and theoretical data relevant to this problem. Reviews of much of this material have been recently performed by Cosby and Lyle (1172) and Jones et al. (1095).

4.1 Threshold Penetration Studies

A number of investigators have attempted, by primarily experimental or empirical means, to establish criteria for the minimum sheet thickness required to prevent penetration by hypervelocity projectiles (see listings in Section B. 4. 1 of Appendix B). As a result of these studies, a crude rule-of-thumb threshold penetration formula has been obtained by Kinard et al. (34) and a more complex formulation has been suggested from limited experiments by Fish and Summers (1099).

4.2 Experimental Studies of Impact Phenomena

Section B. 4. 2 of Appendix B presents an extensive listing of papers concerned primarily with **experimental studies** of hypervelocity impact into single finite plates.

4.3 Theoretical Studies Made with Detailed Hydrodynamic Codes

At least four groups of investigators have performed detailed theoretical studies of the perforation of thin plates by hypervelocity projectiles and of the associated spray pattern, under the assumption of purely hydrodynamic flow, using extensions of the detailed hydrodynamic computer codes mentioned in Section 3. 4 (see listings in Section B. 4. 3 of Appendix B).

4.4 Other Theoretical Studies

In addition to the above described "hydrodynamic code" studies, many investigators have performed other theoretical studies of the thin-plate penetration problem. (see Section B. 4. 4 of Appendix B).

4.5 Impact of Thin Rods

The problem of the impact of thin rods on finite-thickness targets has been theoretically and/or experimentally examined by several investigators. (see Section B. 4. 5 of Appendix B).

4.6 Spallation (Scabbing) Phenomena

Review of some aspects of the subject of spallation or scabbing type fractures produced by high speed impact loads have been presented by Butcher et al. (1146), Rieder (1145), and Rinehart and Pearson (93). These reviews deal primarily with the stress conditions leading to fracture and with fracture mechanisms. Additional papers more directly related to hypervelocity impact problems are listed in Section B. 4. 6 of Appendix B.

4.7 Spray Phenomena

Cosby and Lyle (1172) have recently reviewed much of the existing information regarding the character and distribution of spray particles produced by hypervelocity impact into thin targets. Section B. 4.7 of Appendix B of this report contains a brief listing of some significant contributions to this subject (see also Section B. 4.8 on spallation phenomena); additional information on theoretical studies of spray phenomena is contained in most of the papers listed in Sections B. 3.4 and B. 4.3, both of which are concerned with detailed "hydrodynamic code" solutions of hypervelocity impact problems.

4.8 Oblique Impact Phenomena

Section B. 4.8 of Appendix B presents a listing of papers dealing with primarily experimental studies of the oblique impact of hypervelocity projectiles on thin-plate targets and with their penetration through such targets.

5. Hypervelocity Impact on a Thick Plate Shielded by a Thin Bumper

Various investigators have considered the possibility of shielding thick space-craft elements from hypervelocity meteoroid impact damage by use of a thin "bumper" shield. Existing theoretical and experimental research relevant to this subject has recently been reviewed by Cosby and Lyle (1172). Some other pertinent papers are listed in Section B.5 of Appendix B.

6. Hypervelocity Impact on Multi-Sheet or Complex Targets

Section B.6 of Appendix B presents a listing of theoretical and/or experimental papers dealing with hypervelocity impact into target structures more complex than a thick plate shielded by a thin plate, e. g., multiple plate targets, composite targets, tubes, liquid filled containers, etc.

6.1 Impact on Liquid Filled Containers

When a projectile strikes a liquid-filled thin-walled tank at low speeds, a simple puncture of the wall is produced. For high impact speeds, exceeding critical values on the order of one km/sec (several thousand ft/sec), catastrophic fracturing of the wall can occur, in the form of local tearing and blowout of the tank wall around the impact area. This catastrophic type of failure is generally attributed to the effects of local high-pressure shock waves produced in the liquid by the impacting hypervelocity projectile.

This subject has been recently reviewed by Cosby and Lyle (1172). Experimental studies of the critical failure speeds and types of failure for various tank configurations and projectiles have been made by Stepka et al at NASA-Lewis (1114-1116, 1118) and by Ferguson et al. at the Douglas Aircraft Company (1028). In addition, experimental studies of the pressure wave in the liquid have been reported by Stepka et al. (1117) and Ferguson (1028) and associated theoretical analyses have been made by Chou (1032) and Heyda (382).

6.2 Impact on Combustible Materials

It has been experimentally demonstrated that hypervelocity impact of particles through thin-walled containers of solid rocket fuel or other combustibles can result in ignition and possibly explosive destruction at ambient pressures as low as 0.12 inch of mercury (Carter, 1237). A review of recent material relevant to this subject has been performed by Stepka et al. (1118) (see also listings in Section B. 6. 2 of Appendix B).

6.3 Impact on Tubular Structures

Early experimental investigations of the cratering, dimpling and spalling damage produced by hypervelocity impact into tubular structures were reported by Lieblein et al. (1113) and have been reviewed by Cosby and Lyle (1172). Additional experimental work has been reported by Diedrich et al. (1111, 1112) and McMillan et al. (408, 1072).

7. Impact of Liquid Drops on Liquid Surfaces

The problem of the (low-speed) impact of liquid drops on liquid surfaces has been experimentally and theoretically studied by Engel (1121), 1122, 1161), who has also considered the possible applicability of this information to the hypervelocity impact problem (441, 1123, 1161).

8. Fundamental Research in Solid Mechanics

Section B. 8 of Appendix B presents a listing of books and articles dealing with fundamental research studies containing information relevant to the subject of hypervelocity impact mechanics, but which are primarily concerned with broader subject areas or with lower speed impact phenomena. Topics covered by the documents listed in this section include basic mechanisms of dynamic material deformations,

stress wave propagation, low speed impact phenomena, and theoretical and experimental studies of one-dimensional medium speed and hypervelocity impact behavior (see also Section 9).

9. Equations of State and One-Dimensional Shock Phenomena

Essential factors in the evaluation of hypervelocity impact phenomena by hydrodynamic theories are the equations of state of the projectile and target materials and the associated Hugoniot and adiabatic relationships for one-dimensional shock compression and expansion. Extensive compilations, reviews, and bibliographies of theoretical and experimental information on this subject have been presented by various U. S. and U.S.S.R. investigators (141, 148, 1081-1084, 1086, 1151 and 1211). Recent developments in "equation of state" theory for metals have included substantial contributions by Tillotson (1039), McCloskey (1143) and Wagner et al. (1149). Also there exists a wealth of recent experimental "equation of state" or Hugoniot data, and some associated analyses for specific materials (e.g., see Section B. 9 of Appendix B).

10. Hydrodynamic Code Methods

Section B. 10 of Appendix B presents a listing of papers describing the mathematic formulation of several of the detailed hydrodynamic codes currently used or under development for use in hypervelocity impact studies.

11. Impact Flash and Ionization

A number of investigators have performed experimental and theoretical studies of the optical impact flash and associated ionization produced by the impact of hypervelocity particles and have examined the feasibility of using this phenomenon as an indication of target composition and damage (see listings in Section B. 11 of Appendix B).

12. Explosive and Nuclear Cratering Phenomena

In an attempt to extend knowledge of hypervelocity cratering phenomena beyond present experimental limitations, various investigators have attempted to make use of results of high explosive and nuclear cratering tests. Section B. 12 of Appendix B presents a list of reports dealing either with relevant experimental or theoretical studies of explosive cratering or with their application to the hypervelocity impact problem.

13. Metallurgical and Microscopic Considerations in Hypervelocity Impact

In recognition of the fact that microscopic considerations of hypervelocity impact phenomena have not provided a sufficiently detailed foundation for dealing with hypervelocity impact problems, many investigators have recently focused considerable attention on detailed microscopic and metallurgical studies of the impact process, including both studies of experimental impact phenomena and basic theoretical studies. A listing of significant contributions to this subject is given in Section B. 13 of Appendix B (see also Reference 1079).

13.1 Material Hardness Studies

Section B. 13.1 presents a listing of books and articles containing basic theoretical and experimental information on the subject of material hardness and its relationship to other material properties and to shock loading effects. It should be noted that some of the older articles contain much information relevant to the hypervelocity impact problem which we have not found in more recent publications.

14. Thermal Considerations in Hypervelocity Impact

Recent work on hypervelocity impact has included considerable attention to studies of the temperature increases produced in targets under room temperature impact conditions, to the effects of these temperature increases on target strength properties and to the resulting effects of these strength changes on the late-time stages of the impact process. Also considerable attention has been directed to impact studies at both very high and very low ambient target temperatures. A listing of reports pertinent to this subject is given in Section B. 14 of Appendix B.

15. Meteoroid Environment and Design Considerations

Section B. 15 of Appendix B presents a partial listing of recent papers dealing either with definition of the meteoroid environment, its hazards to spacecraft, or with design measures for their protection.

BIBLIOGRAPHIC FORMAT

Appendices A through D of this report present a four-part bibliography of literature related to the subject of hypervelocity impact.

The first section of this bibliography, presented in Appendix A, consists of a complete bibliographic listing of literature considered, arranged in alphabetical order of the originating agency. The first line of each listing presents the following information (with minor obvious variations): reference number*; author's names; date of report; originating agency (usually of the first author where several agencies are involved); name of journal or standard report series identification; volume-issue and page numbers for journal articles; NASA N-series identification or IAA A-series identification, if any; and DDC AD-series identification, if any).

Subsequent lines contain the report title and additional information on availability of the article cited. The following abbreviations are used frequently: HVIS for Symposium on Hypervelocity Impact; CR for NASA Contractor Report; and SP for NASA Special Publication.

The second section of the bibliography, presented in Appendix B, contains an abbreviated bibliographic listing (first line of the corresponding listing in Appendix A), arranged by the subject content breakdown listed in the table of contents.

The third section of the bibliography, presented in Appendix C, contains an abbreviated bibliographic listing, arranged alphabetically by the first author's name.

The last section of the bibliography, presented in Appendix D, contains an abbreviated bibliographic listing, arranged in numerical order by reference number. This particular listing may be used to locate references referred to in the text. It should be noted that reference numbers below 1000 refer to documents listed and evaluated by Herrmann, Jones and Polhemus (438, 1095) and are identical to their reference numbers.

ERRATA

In each of the bibliographic appendices to this report, the report dates for papers presented at the Third and Fifth Symposia on Hypervelocity Impact are listed as 1958 and 1961, respectively, which were the dates of the symposia, rather than the dates of publication of the symposia proceedings. The corresponding publication dates are 1959 and 1962, respectively.

* Reference numbers below 1000 are identical to those used by Herrmann, Jones and Polhemus (438, 1095); reference numbers above 1000 are presented in numerical order in Appendix A.

APPENDIX A

COMPLETE BIBLIOGRAPHIC LISTINGS
ARRANGED ALPHABETICALLY BY AGENCIES

U.S. REPORTS

AEROJET-GENERAL CORP - DOWNEY, CALIFORNIA
1001 KREYENHAGEN K N ZERNOW 1961 AEROJ
PENETRATION OF THIN PLATES

HVIS-5-1-2 N62-16578

- 171 MORTENSEN R B ET AL 1963 AEROJ HVIS-6-3 AD-423802
EFFECTS OF 3 TO 12 KM/SEC IMPACTS ON FINITE TARGETS
- 1002 WAGNER M H ET AL 1962 AFSWC(AEROJ)TDR-62-66-1 AD-286345
DETERMINATION OF HUGONIOT EQUATIONS-OF-STATE FOR POLYMERS AND REENTRY
VEHICLE MATERIALS AND INVESTIGATIONS OF FRACTURE PHENOMENA
- 1003 ZERNOW L 1963 AEROJ HVIS-6-3 AD-423802
INTRODUCTORY PAPER - EXPERIMENTATION

AMERICAN MACHINE AND FOUNDRY COMPANY

- 1004 FUGELSO L E 1961 AMF HVIS-5-1-1 N62-16557
A THEORETICAL STUDY OF DYNAMIC PLASTIC DEFORMATION UNDER IMPACT LOADS

ALLIED RESEARCH ASSOCIATES, INC

- 1004 GERARD G KYLE P E 1965 ARA ARA-65-3
THE POTENTIAL OF METALLURGICAL GAGING FOR MEASUREMENT OF MICROMeteorOID
VELOCITY AND MASS IN SPACE EXPERIMENTS
- 1005 KYLE P E GERARD G 1965 ARA HVIS-7-5 AD-463231
THE APPLICATION OF METALLURGICAL GAGING FOR HYPERVELOCITY IMPACT STUDIES

ARO INC (ARNOLD ENGR DEV CENTER)

- 164 GOODMAN E H LILES C D 1963 ARO HVIS-6-2-2 AD-423064
PARTICLE-SOLID IMPACT PHENOMENA
SEE ALSO AEDC-TDR-62-202 N62-17867 AD-287808
- 163 KINSLOW R 1963 ARO AEDC-TDR-63-197 AD-421578
PROPERTIES OF SPHERICAL STRESS WAVES PRODUCED BY HYPERVELOCITY IMPACT
SEE ALSO HVIS-6-2-1
- 1006 KINSLOW R 1964 ARO AEDC-TDR-64-049
OBSERVATIONS OF HYPERVELOCITY IMPACT OF TRANSPARENT PLASTIC TARGETS
SEE ALSO HVIS-7-6
- 1007 KINSLOW R 1965 ARO INT SCI TECH 40(APRIL)
COLLISIONS AT HIGH VELOCITY
- 1008 KINSLOW R 1967 ARO AIAA-P-67-140
STRESS WAVES IN LAMINATED MATERIALS
- 1009 PAYNE J J 1965 ARO AEDC-TR-65-034 N65-16964 AD-456391
IMPACTS OF SPHERICAL PROJECTILES OF ALUMINUM, STAINLESS STEEL, TITANIUM,
MAGNESIUM, AND LEAD INTO SEMI-INFINITE TARGETS OF ALUMINUM AND STAINLESS
STEEL

AVCO CORPORATION

- 1010 MCMATH R K 1966 AVCO-LOWELL CR-65375 N66-27310
STUDY OF METEOROID IMPACT INTO ABLATIVE HEAT SHIELD MATERIALS
- 219 ROCKWITZ M ET AL 1961 AVCO-WIL HVIS-5-1-2 N62-16573
HYPERVELOCITY IMPACT OF HEATED COPPER
- 220 SCHIPPER J F 1961 AVCO-WIL HVIS-5-1-1 N62-16561
A MODEL OF NON-EXPLOSIVE IMPACT

BALLISTIC RESEARCH LABORATORIES

- 1011 ALLISON F E 1961 BRL HVIS-5-1-1 N62-16553
INTRODUCTION TO THE THEORY SESSIONS
- 1012 ALLISON F E 1965 BRL HVIS-7-5 AD-463231
MECHANICS OF HYPERVELOCITY IMPACT
- 1013 EICHELBERGER R J 1958 BRL HVIS-3-1 AD-233487
SUMMARY - THIRD HYPERVELOCITY IMPACT SYMPOSIUM
- 1014 EICHELBERGER R J 1961 BRL HVIS-5-1-2 N62-16564
SUMMARY - EXPERIMENTAL STUDIES
- 1015 EICHELBERGER R J 1961 BRL HVIS-5-1-2 N62-16565
INTRODUCTION - EXPERIMENTAL STUDIES
- 1016 EICHELBERGER R J 1963 BRL HVIS-6-2-2 AD-423064
SUMMARY - THEORETICAL AND EXPERIMENTAL STUDIES OF CRATER FORMATION
- 1017 EICHELBERGER R GEHRING 1962 BRL ARS J 32-10 1583-1590
EFFECT OF METEOROID IMPACTS ON SPACE VEHICLES
- 4 FELDMAN J B JR 1958 BRL HVIS-3-1 AD-233487
VOLUME-ENERGY RELATIONS FROM SHAPED CHARGE JET PENETRATIONS
- 6 FELDMAN J B JR 1960 BRL HVIS-4-2 AD-244476
VOLUME-ENERGY RELATION FROM SHAPED CHARGE JET PENETRATIONS
- 264 FRASIER J T KARPOV B G 1961 BROWN U HVIS-5-1-2 N62-16567
IMPACT EXPERIMENTS ON WAX
- 1018 FRASIER J T ET AL 1965 BRL HVIS-7-5 AD-463231
THE BEHAVIOR OF WAX TARGETS SUBJECTED TO HYPERVELOCITY IMPACTS
- 2 GEHRING J W JR 1958 BRL HVIS-3-1 AD-233487
AN ANALYSIS OF MICROPARTICLE CRATERING IN A VARIETY OF TARGET MATERIALS
- 7 GEHRING J W JR 1960 BRL HVIS-4-2 AD-244476
OBSERVATIONS OF THE PHENOMENA OF HYPERVELOCITY IMPACT
- 8 GEHRING J W RICHARDS L 1960 BRL HVIS-4-3 AD-244477
FURTHER STUDIES OF MICRO-PARTICLE CRATERING IN A VARIETY OF TARGET MATERIALS
- 9 GLASS C M POND R B 1960 BRL HVIS-4-3 AD-244477
A METALLURGICAL APPROACH TO THE HYPERVELOCITY PROBLEM

- 3 KINEKE J H JR 1958 BRL HVIS-3-1 AD-233487
AN EXPERIMENTAL STUDY OF CRATER FORMATION IN LEAD
- 5 KINEKE J H JR 1960 BRL HVIS-4-1 AD-244475
AN EXPERIMENTAL STUDY OF CRATER FORMATION IN METALLIC TARGETS
- 263 KINEKE J H JR 1961 BRL HVIS-5-1-2 N62-16566
OBSERVATIONS OF CRATER FORMATION IN DUCTILE MATERIALS
- 266 KINEKE J H RICHARDUS L G 1963 BRL HVIS-6-2-2 AD-423064
INFLUENCE OF TARGET STRENGTH ON HYPERVELOCITY CRATER FORMATION IN ALUMINUM
- 267 KINEKE J H JR VITALI R 1963 BRL HVIS-6-2-2 AD-423064
TRANSIENT OBSERVATIONS OF CRATER FORMATION IN SEMI-INFINITE TARGETS
- 1019 VITALI R ET AL 1961 BRL HVIS-5-1-2 N62-16577
PERFORATION OF FINITE TARGETS BY HIGH VELOCITY PROJECTILES

BATTELLE MEMORIAL INSTITUTE

- 1246 BELTON W L ET AL 1967 BATTELLE BAT-197A-21-2(REV 2) AD-809916
HYPERVELOCITY-IMPACT DATA INDEX - PART 1 - BIBLIOGRAPHY
- 1020 BERT C W ET AL 1963 BATTELLE BAT-197-16-1 AD-408386
PRELIMINARY SURVEY ON HYPERVELOCITY-IMPACT PROPERTIES OF PLASTICS AND PLASTIC LAMINATES
- 1021 GIDEON D N ET AL 1965 BATTELLE BAT-197-21-2(REV 1) AD-463372
HYPERVELOCITY-IMPACT DATA INDEX - PART 1 - BIBLIOGRAPHY
- 1022 HAN L S HESS R E 1965 BATTELLE HVIS-7-4 AD-463230
A STUDY BY A PERTURBATION METHOD OF THE HYPERVELOCITY IMPACT OF ROD-LIKE PROJECTILES UPON A THIN VISCOPLASTIC PLATE

THE BOEING COMPANY - SEATTLE

- 628 FYFE I M 1961 BOEING-SEA HVIS-5-1-1 N62-16562
APPLICATION OF 'HYDRODYNAMIC' THEORY TO THE LOW STRESS RANGE OF HYPERVELOCITY IMPACT PROBLEMS
- 1023 LUNDBERG J F ET AL 1966 BOEING-SEA J SPACECRAFT 3-2 182-187
IMPACT PENETRATION OF MANNED SPACE STATIONS

BROWN UNIVERSITY

- 1024 KOLSKY H 1966 BROWN U A66-42268
EXPERIMENTAL STUDIES IN STRESS WAVE PROPAGATION
PROC 5TH US NAT CONG APPL MECH, U MINNESOTA, MINNEAPOLIS, MINN
JUNE 14-17, 1966
ASME PUBL
- 1025 LIFSHITZ J M KOLSKY H 1965 BROWN U J MECH PHYS SOLIDS 13-6 361-376
THE PROPAGATION OF SPHERICALLY DIVERGENT STRESS PULSES IN LINEAR VISCOELASTIC SOLIDS

BUREAU OF MINES - PITTSBURG

574 WATSON R W ET AL 1963 BUR MINES HVIS-6-3 AD-423802
THIN PLATE PERFORATION STUDIES WITH PROJECTILES IN THE VELOCITY RANGE
FROM 2 TO 5 KM/SEC

CALIFORNIA WESTERN UNIVERSITY - SEE GENERAL DYNAMICS/ASTRONAUTICS

CARNEGIE INSTITUTE OF TECHNOLOGY

- 115 ALLISON F E 1958 CARNEGIE HVIS-3-1 AD-233487
A REVIEW OF THE THEORIES CONCERNING CRATER FORMATION BY HYPERVELOCITY
IMPACT
- 110 ALLISON F E BRYAN G M 1957 CARNEGIE HVIS-2-1 AD-201902
CRATERING BY A TRAIN OF HYPERVELOCITY FRAGMENTS
- 118 ALLISON F E ET AL 1960 CARNEGIE HVIS-4-1 AD-244475
EFFECTS OF TARGET TEMPERATURE ON HYPERVELOCITY CRATERING
- 135 BRYAN G M 1960 CARNEGIE HVIS-4-3 AD-244477
A MODEL OF OBLIQUE IMPACT
- 1026 BRYAN G M 1961 CARNEGIE HVIS-5-1-2 N62-16572
OBLIQUE IMPACT OF HIGH VELOCITY STEEL PELLETS ON LEAD TARGETS
- 1236 BRYAN G M PUGH E M 1962 CARNEGIE J APPL PHYS 33-2 734-738
CRATERING OF LEAD BY OBLIQUE IMPACTS OF HYPERVELOCITY STEEL PELLETS
- 117 CULP F L 1958 CARNEGIE HVIS-3-1 AD-233487
VOLUME-ENERGY RELATION FOR CRATERS FORMED BY HIGH VELOCITY PROJECTILES
- 323 WATSON R W 1961 CARNEGIE HVIS-5-1-2 N62-16576
THE PERFORATION OF THIN PLATES BY HIGH VELOCITY FRAGMENTS

COLORADO SCHOOL OF MINES

119 MAURER W C RINEHART J S 1960 COL SCH MINES HVIS-4-3 AD-244477
IMPACT CRATER FORMATION IN ROCK
SEE ALSO J APPL PHYS 31-7 1247-1252 1960

CORNELL AERONAUTICAL LABORATORY, INC

- 1027 RAE W J 1965 CORNELL AER L HVIS-7-4 AD-463230
A LINEAR-ELASTIC TREATMENT OF THE SPALL-FRACTURE PROBLEM
- 341 RAE W J KIRCHNER H P 1963 CAL HVIS-6-2-1 AD-423063
A BLAST-WAVE THEORY OF CRATER FORMATION IN SEMI-INFINITE TARGETS

DOUGLAS AIRCRAFT CO - SANTA MONICA

- 1028 FERGUSON C W 1966 DOUGLAS SM-52027 N66-22267
HYPERVELOCITY IMPACT EFFECTS ON LIQUID HYDROGEN TANKS
- 1029 WALL J K 1964 DOUGLAS-SM AIAA J 2-7 1242-1246
THEORETICAL PENETRATION OF HYPERVELOCITY PROJECTILES INTO MASSIVE TARGETS

DREXEL INSTITUTE OF TECHNOLOGY

- 1030 CHOU P C 1961 DREXEL HVIS-5-1-1 N62-16563
VISCO-PLASTIC FLOW THEORY IN HYPERVELOCITY PERFORATION OF PLATES
- 1030 CHOU P C ALLISON F E 1966 DREXEL INST J APPL PHYS 37-2 853-860
STRONG PLANE SHOCK PRODUCED BY HYPERVELOCITY IMPACT AND LATE-STAGE EQUIVALENCE
- 1031 CHOU P C BURNS B P 1967 DREXEL INST J APPL PHYS 38-2 553-560
LATE-STAGE EQUIVALENCE IN ONE-DIMENSIONAL IMPACTS
- 1032 CHOU P C ET AL 1963 DREXEL INST DIT-R-160-1 CR 50249
ANALYSIS OF PEAK PRESSURE GENERATED IN WATER BY HIGH VELOCITY IMPACT
- 1033 CHOU P C ET AL 1965 DREXEL INST HVIS-7-2 AD-463228
THE STRONG PLANE SHOCK PRODUCED BY HYPERVELOCITY IMPACT AND LATE-STAGE EQUIVALENCE

FUNDAMENTAL METHODS ASSOCIATES INC

- 1034 KLAHR C N 1965 FUND METH ASS HVIS-7-6 AD-463232
DUSTWALL SHIELDING AGAINST METEOROIDS

GCA CORPORATION

- 1035 EHRENFEILD J ET AL 1966 GCA J APPL PHYS 37-13 4737-4738
HUGONIOT EQUATION OF STATE OF ALKALI METALS

GENERAL ATOMIC DIVISION OF GENERAL DYNAMICS

- 1036 DIENES J K 1965 GEN ATOMIC HVIS-7-2(GA 5755) AD-463228
LATE-STAGE EQUIVALENCE AND SIMILARITY THEORY FOR ONE-DIMENSIONAL IMPACTS
- 1037 DIENES J K ET AL 1965 GEN ATOMIC GA-6509 AD-617540
ANNUAL STATUS REPORT ON THE THEORY OF HYPERVELOCITY IMPACT
- 1038 TEICHMANN T 1965 GEN ATOMIC GAMD-6501 AD-620193
REMARKS ON SIMILARITY SOLUTIONS FOR HYPERVELOCITY IMPACT
- 1039 TILLOTSON J H 1962 GEN ATOMIC GA-3216 AD-486711
METALLIC EQUATIONS OF STATE FOR HYPERVELOCITY IMPACT

- 1040 WALSH J M JOHNSON W E 1965 GEN ATOMIC HVIS-7-2 AD-463228
ON THE THEORY OF HYPERVELOCITY IMPACT
- 365 WALSH J M TILLUTSON J H 1963 GEN ATOMIC GA-3827 N63-14302
HYDRODYNAMICS OF HYPERVELOCITY IMPACT
ALSO IN HVIS-6-2-1 AD-423063
- 1041 WALSH J M ET AL 1966 GEN ATOMIC
SUMMARY REPORT OF THE THEORY OF HYPERVELOCITY IMPACT
IN THE FLUID DYNAMIC ASPECTS OF SPACE FLIGHT AGARDOGRAPH 87-1

GENERAL DYNAMICS/ASTRONAUTICS

- 1042 ALI A 1963 GD/ASTRO ERR-AN-167
SPACE VEHICLE VULNERABILITY TO METEOROIDS
- 1043 ROLSTEN R F HUNT H H 1963 GD/ASTRO AIAA J 1-8 1893-1895
IMPACT FORCE AND CRATER SURFACE AREA
- 1044 ROLSTEN R F HUNT H H 1963 CALIF WEST U ASTRO AEROSP ENGR 1-10 20-24
HYPERVELOCITY IMPACT ON PRESSURIZED STRUCTURES
- 1045 ROLSTEN R F HUNT H H 1964 CALIF WEST U J SPACECRAFT 1-3 351-352
IMPACT FORCE PER CRATER AREA RELATED TO THE TENSILE STRENGTH
- 1046 ROLSTEN R F SCHMITT R 1963 CALIF WEST U J APPL PHYS 34-10 3010-3012
HYPERVELOCITY IMPACT OF RADIOACTIVE PROJECTILES INTO STAINLESS STEEL AND
ALUMINUM
- 1047 ROLSTEN R F ET AL 1964 CALIF WEST U J APPL PHYS 35-3-1 556-559
AN EXAMPLE OF HOLE DIAMETER IN THIN PLATES DUE TO HYPERVELOCITY IMPACT
- 1048 ROLSTEN R F ET AL 1964 CALIF WEST U J APPL PHYS 35-5 1655-1656
DEFORMATION AND WAVE STRUCTURE PRODUCED BY HIGH-VELOCITY IMPACT

GENERAL ELECTRIC COMPANY - PHILADELPHIA

- 376 BRUCE E P 1961 GE-PHILA HVIS-5-1-2 N62-16569 AD-600668
REVIEW AND ANALYSIS OF HIGH VELOCITY IMPACT DATA
- 1049 BRUCE E P 1965 GE-PHILA HVIS-7-6 AD-463232
HYPERVELOCITY IMPACT ON SINGLE THIN SHEET STRUCTURES - INCIPIENT
PERFORATION CONDITIONS
- 382 HEYDA J F 1963 GE-PHILA HVIS-6-2-1 AD-423063
SHOCK FRONT VARIATION IN TIME FOR HIGH SPEED IMPACT INTO WATER
- 1050 HEYDA J F RINEY T D 1964 GE-PHILA R64SD87 AD-452991
PEAK AXIAL PRESSURES IN SEMI-INFINITE MEDIA UNDER HYPERVELOCITY IMPACT
ALSO IN PROC HVIS-7
- 1051 HEYDA J F RINEY T D 1965 GE-PHILA ATL-TR-65-26 N65-23644 AD-461267
ATTENUATION OF SHOCKS PRODUCED BY UNLIKE METAL IMPACT
- 1052 HEYDA J F RINEY T D 1966 GE-PHILA CR-609
PEAK PRESSURES IN THICK TARGETS GENERATED BY REDUCED DENSITY PROJECTILES

- 21 KORNHAUSER J 1958 GE-PHILA HVIS-3-1 AD-233487
SURFACE ROUGHNESS CAUSED BY METEOROID IMPACTS
- 1053 KORNHAUSER M 1964 SPARTAN BKS INC BALTIMORE MD
STRUCTURAL EFFECTS OF IMPACT
- 381 RINEY T D 1963 GE-PHILA HVIS-6-2-1 AD-423063
VISCO-PLASTIC SOLUTION OF HYPERVELOCITY IMPACT CRATERING PHENOMENON
- 1054 RINEY T D 1963 GE-PHILA A66-31996
BEHAVIOR OF METALS DURING HYPERVELOCITY IMPACT CRATERING
IN USTRACH S SCANLAN R H (ED) DEVELOPMENTS IN SOLID MECHANICS
VOL 2 PT 2 SOLID MECHANICS PERGAMON PRESS N Y
- 1055 RINEY T D 1964 GE-PHILA ATL-TDR-64-8
THEORETICAL HYPERVELOCITY IMPACT CALCULATIONS USING THE PICWICK CODE
- 1056 RINEY T D 1965 GE-PHILA AIAA J 3-1 52-60
DEPTH OF PENETRATION OF HYPERVELOCITY PROJECTILES
- 372 RINEY T D CHERNOFF P R 1961 GE-PHILA HVIS-5-1-1 N62-16556
INERTIAL, VISCOUS AND PLASTIC EFFECTS IN HIGH SPEED IMPACT
- 1240 RINEY T D HALDA E J 1967 GE-PHILA A67-23716
EFFECTIVENESS OF METEOROID BUMPERS COMPOSED OF TWO LAYERS OF DISTINCT
MATERIALS
PAPER PRESENTED AT AIAA/ASME 8TH STRUCTURES, STRUCTURAL DYNAMICS AND
MATERIALS CONFERENCE, PALM SPRINGS, CALIFORNIA, MARCH 29-31, 1967
PUBLISHED BY AIAA
- 1057 RINEY T D HEYDA J F 1964 GE-PHILA ATL-TR-64-64 AD-446745
HYPERVELOCITY IMPACT CALCULATIONS AND THEIR CORRELATION WITH EXPERIMENT
- 1058 RINEY T D HEYDA J F 1965 GE-PHILA HVIS-7-2 AD-463228
HYPERVELOCITY IMPACT CALCULATIONS
- 1059 RINEY T D ET AL 1966 GE-PHILA AFATL-TR-66-71 AD-488138
IMPACT, SHOCK FOCUSING, AND STRESS PROPAGATION IN THIN PLATES
- GENERAL MOTORS DEFENSE RESEARCH LABS - SANTA BARBARA
- 1060 CHAREST J A 1964 GM-SB TR-64-58 N66-37523
MEASUREMENTS OF SHOCK WAVE PRESSURES GENERATED BY HYPERVELOCITY IMPACTS
IN ALUMINUM
NASA-MARSHALL CONTRACT NAS-11118
- 1235 CHARTERS A C ET AL 1966 GM-SB AGARDOPH 87-1
IMPACT PHYSICS, METEOROIDS, AND SPACECRAFT STRUCTURES
IN THE FLUID DYNAMIC ASPECTS OF SPACE FLIGHT GORDON AND BREACH SCIENCE PUBLISHERS NEW YORK
- 1061 CHRISTMAN D R 1966 GM-SB AIAA J 4-10 1872-1874
TARGET STRENGTH AND HYPERVELOCITY IMPACT
- 1062 CHRISTMAN D R GEHRING J 1965 GM-SB TR-65-04
PENETRATION MECHANISMS OF HIGH VELOCITY PROJECTILES - SEMIANNUAL REPORT
URL CONTRACT DA-04-495-AMC-534(R)

- 1063 CHRISTMAN D R GEHRING J 1965 GM-SB TR-65-50
PENETRATION MECHANISMS OF HIGH VELOCITY PROJECTILES - FINAL REPORT
BRL CONTRACT DA-04-495-AMC-534(R)
- 1064 CHRISTMAN D R GEHRING J 1966 GM-SB J APPL PHYS 37-4 1579-1587
ANALYSIS OF HIGH-VELOCITY PROJECTILE PENETRATION MECHANICS
- 1065 CHRISTMAN D R ET AL 1965 GM-SB HVIS-7-6 AD 463232
PENETRATION MECHANISMS OF HIGH-VELOCITY RODS
- 1066 GEHRING J W WARNICA R L 1963 GM-SB HVIS-6-2-2 AD-423064
AN INVESTIGATION OF THE PHENOMENA OF IMPACT FLASH AND ITS POTENTIAL USE
AS A HIT DETECTION AND TARGET DISCRIMINATION TECHNIQUE
- 1067 GEHRING J W ET AL 1965 GM-SB HVIS-7-5 AD-463231
EXPERIMENTAL STUDIES OF IMPACT PHENOMENA QND CORRELATION WITH THEORETICAL
MODELS
- 1068 GEHRING J W ET AL 1965 GM-SB J SPACECRAFT 2-5 731-737
EXPERIMENTAL STUDIES CONCERNING THE METEOROID HAZARD TO AEROSPACE
MATERIALS AND STRUCTURES
- 1069 GEHRING J W ET AL 1965 GM-SB ASM-TR-W-13-5-65
MATERIALS TO RESIST METEOROID IMPINGEMENT
- 407 MAIDEN C J 1963 GM-SB HVIS-6-3 AD-423802
EXPERIMENTAL AND THEORETICAL RESULTS CONCERNING THE PROTECTIVE ABILITY
OF A THIN SHIELD AGAINST HYPERVELOCITY PROJECTILES
- 404 MAIDEN C J 1963 GM-SB TR-63-203 N63-16482 AD-406169
METEOROID IMPACT
- 1241 MAIDEN C J MCMILLAN A R 1964 GM-SB AIAA J 2-11 1992-1998
AN INVESTIGATION OF THE PROTECTION AFFORDED A SPACECRAFT BY A THIN SHIELD
- 1070 MAIDEN C J ET AL 1963 GM-SB TR-63-208 A64-13304 AD-404274
INVESTIGATION OF FUNDAMENTAL MECHANISM OF DAMAGE TO THIN TARGETS BY
HYPERVELOCITY PROJECTILES - SEMIANNUAL REPORT
CONTRACT ARPA NONR-3891(00)(X)
- 405 MAIDEN C J ET AL 1963 GM-SB TR-63-201 AD-404837
INVESTIGATION OF FUNDAMENTAL MECHANISM OF DAMAGE TO THIN TARGETS BY
HYPERVELOCITY PROJECTILES
CONTRACT ARPA NONR-3891(00)(X)
- 1071 MAIDEN C J ET AL 1965 GM-SB HVIS-7-4 AD-463230
THIN SHEET IMPACT
ALSO NASA CR-295
- 408 MCMILLAN A R 1963 GM-SB HVIS-6-3 AD-423802
AN INVESTIGATION OF THE PENETRATION OF HYPERVELOCITY PROJECTILES INTO
COMPOSITE LAMINATES
- 1238 MCMILLAN A R 1966 GM-SB TR-66-67
EXPERIMENTAL INVESTIGATIONS OF SIMULATED METEOROID DAMAGE TO VARIOUS
SPACECRAFT STRUCTURES

1072 MCMILLAN A R ET AL 1966 NASA-LEWIS TN-D-3512
HYPERVELOCITY IMPACTS INTO STAINLESS-STEEL TUBES ARMORED WITH REINFORCED
BERYLLIUM

1073 MEYERS C L ET AL 1964 GM-SB TR-64-48 N65-33856
RESEARCH ON THE PROPERTIES OF OPTIMUM METEOROID SHIELDS - SUMMARY REPORT
NASA-MARSHALL CONTRACT NAS8-11118

U.S. GEOLOGICAL SURVEY

446 MOORE H J ET AL 1961 GEOL SURV HVIS-5-1-2 N62-16579
THE GEOLOGY OF HYPERVELOCITY IMPACT CRATERS

451 MOORE H J ET AL 1963 GEOL SURVEY HVIS-6-2-2 AD-423064
FLUID IMPACT CRATERS AND HYPERVELOCITY -- HIGH-VELOCITY IMPACT
EXPERIMENTS IN METALS AND ROCKS

1074 MOORE H J ET AL 1965 GEOL SURV HVIS-7-4 AD 463230
CHANGE OF EFFECTIVE TARGET STRENGTH WITH INCREASING SIZE OF HYPERVELOCITY
IMPACT CRATERS

GOODYEAR AIRCRAFT CORPORATION

411 REYNOLDS B W EMMONS R H 1963 GOODYR HVIS-6-3 AD-423802
A NEW SYSTEM OF PROTECTION FROM HYPERVELOCITY PARTICLES

HAYES INTERNATIONAL CORPORATION - BIRMINGHAM

1075 HAYES INT CORP 1963 APGC TDR-63-22 AD-401759
STUDY OF TARGET PENETRATION PREDICTION BY HIGH SPEED AND ULTRA HIGH
SPEED BALLISTIC IMPACT

1076 HAYES INT CORP 1964 ATL TDR-64-51 AD-447004
TERMINAL BALLISTIC TARGET ANALYSIS AND STUDY OF TARGET VULNERABILITY TO
VERY HIGH SPEED IMPACT

ITT RESEARCH INSTITUTE (FORMERLY ARMOUR RESEARCH INST)

210 HOENIG S A RITTER A 1957 ARMOUR HVIS-2-1 AD-201902
PROBLEMS IN METEORIC EROSION

1077 ZAKER T A 1965 IITRI AIAA J 3-7 1372-1373
COMMENTS ON 'AN ANALYTICAL APPROACH TO HYPERVELOCITY IMPACT'

JOHN HOPKINS UNIVERSITY

1078 DIETRICH A M ET AL 1965 J HOPKINS U HVIS-7-5 AD-463231
CALCULATION OF MAXIMUM HYPERVELOCITY IMPACT DAMAGE FROM MATERIAL
PROPERTIES

- 1079 FITZGERALD E R 1966 JOHN HOPKINS U
PARTICLE WAVES AND DEFORMATION IN CRYSTALLINE SOLIDS
INTERSCIENCE PUBLISHERS, N Y
- 1080 MOBLEY C E POND R B 1965 J HOPKINS U HVIS-7-5
ENERGY BALANCES FOR HYPERVELOCITY TARGETS AD-463231
- 421 POND R B ET AL 1963 JOHN HOPKINS HVIS-6-2-2
ENERGY BALANCES IN HYPERVELOCITY PENETRATION AD-423064

LIBRARY OF CONGRESS - AEROSPACE TECHNOLOGY DIVISION

- 1081 ANON 1964 ATD-LIB CONGR AID P-64-44
NUCLEAR WEAPON EFFECTS - COMPILATION OF ABSTRACTS-1 AD-602358
- 1082 ANON 1965 ATD-LIB CONGR P-65-1
NUCLEAR WEAPON EFFECTS - COMPILATION OF ABSTRACTS-2 AD-610054
- 1083 KSANDER Y 1966 ATD-LIB CONG REP-66-45
NUCLEAR WEAPON EFFECTS - COMPILATION OF ABSTRACTS-3 AD-635477
- 1084 PINDY F V 1966 ATD-LIB CONG REP-66-60
NUCLEAR WEAPON EFFECTS - COMPILATION OF ABSTRACTS-4 AD-647408

LOCKHEED MISSILES AND SPACE COMPANY

- 1085 GRAZIANO E MCCORMICK H 1963 LOCKHEED-MSC SB-63-58
THE METEOROID HAZARD TO SPACE VEHICLES - AN ANNOTATED BIBLIOGRAPHY AD-431973
- 433 SANDORFF P E 1963 LOCKHEED MSC HVIS-6-3
A METEOROID BUMPER DESIGN CRITERION AD-423802
- 434 STERBENTZ W H LONG L L 1963 LOCKHEED MSC HVIS-6-3
METEOROID EFFECTS ON NUCLEAR ROCKET SPACE VEHICLE MISSION SUCCESS AD-423802
- 1086 STROMER P R 1963 LOCKHEED-MSC SB-63-31
SHOCK WAVE PROPAGATION IN SOLIDS - AN ANNOTATED BIBLIOGRAPHY AD-419449

LOS ALAMOS SCIENTIFIC LABORATORY

- 1087 AMSDEN A A 1966 LASL LA-3466 N67-10529
THE PARTICLE-IN-CELL METHOD FOR THE CALCULATION OF THE DYNAMICS OF
COMPRESSIBLE FLUIDS
- 148 MCQUEEN R G MARSH S P 1960 LASL J APPL PHYS 31-7 1253-1269
EQUATION OF STATE FOR NINETEEN METALLIC ELEMENTS FROM SHOCK-WAVE
MEASUREMENTS TO TWO MEGABARS
- 1088 WALSH J M RICE M H 1957 LASL J CHEM PHYS 26-4 815-823
DYNAMIC COMPRESSION OF LIQUIDS FROM MEASUREMENTS ON STRONG SHOCK WAVES
- 141 WALSH J M ET AL 1957 LASL PHYS REV 108-2 196-216
SHOCK-WAVE COMPRESSIONS OF TWENTY-SEVEN METALS - EQUATIONS OF STATE OF
METALS

1089 ZUKAS E G 1966 LASL METALS ENGR QUAR 6-2 1-20
SHOCK WAVE STRENGTHENING - STATE OF THE ART

MARTIN MARIETTA CORPORATION - DENVER

1090 BOUMA D D BURKITT W C 1966 MARTIN-DENV CR-664
MULTIVARIABLE ANALYSIS OF THE MECHANICS OF PENETRATION OF HIGH SPEED
PARTICLES
NASA WESTERN OPERATIONS OFFICE CONTRACT NAS 7-219

1091 REISMAN H ET AL 1964 MARTIN-DENV CR-64-5
MULTIVARIABLE ANALYSIS OF THE MECHANICS OF PENETRATION OF HIGH SPEED
PARTICLES
NASA HQ CONTRACT NAS 7-219

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

437 HERRMANN W JONES A H 1961 MIT HVIS-5-1-2 N62-16568
CORRELATION OF HYPERVELOCITY IMPACT DATA

438 HERRMANN W JONES A H 1961 MIT ASRL-R-99-1 AD-267289
SURVEY OF HYPERVELOCITY IMPACT INFORMATION

1092 HERRMANN W JONES A H 1961 MIT ASRL-R-99-1-A AD-267290
SURVEY OF HYPERVELOCITY IMPACT INFORMATION-ADDENDUM

440 HERRMANN W JONES A H 1963 ASD/MIT TDR-63-140 AD-408777
HYPERVELOCITY IMPACT STATUS OF EXPERIMENTS
IN PROC SYM STRUCTURAL DYNAMICS UNDER HIGH IMPULSE LOADING SEPT 1962

1093 HERRMANN W ET AL 1962 ASD/MIT TDR-62-399 AD-288885
STRESS WAVE PROPAGATION AND SPALLATION IN UNIAXIAL STRAIN

1094 HERMANN W ET AL 1963 AFSWC/MIT TDR-63-12 AD-410386
THE INCLUSION OF MATERIAL STRENGTH IN HYDRODYNAMIC CALCULATIONS

1095 JONES A H ET AL 1963 MIT ASRL-R-99-2 AD-432815
SURVEY OF HYPERVELOCITY IMPACT INFORMATION-II
ALSO ESD-TDR-63-671

24 OLSHAKER A E 1960 MIT J APPL PHYS 31-12 2118-2120
EXPERIMENTAL INVESTIGATION IN LEAD OF THE WHIPPLE 'METEOR BUMPER'
SEE ALSO HVIS-4-2

25 SLATTERY R E CLAY W G 1960 MIT-LL HVIS-4-3 AD-244477
THE PENETRATION OF THIN RODS INTO ALUMINUM

NASA-AMES

32 CHARTERS A C 1960 NASA-AMES SCI AMER 203-10 128-140
HIGH-SPEED IMPACT

26 CHARTERS A C LOCKE G S 1958 NACA-AMES RM-A58B26
A PRELIMINARY INVESTIGATION OF HIGH-SPEED IMPACT - THE PENETRATION OF
SMALL SPHERES INTO THICK COOPER TARGETS

- 29 CHARTERS A C SUMMERS J 1960 NOL(NASA-AMES)NOLR-1238
COMMENTS ON PHENOMENA OF HIGH-SPEED IMPACT
- 445 DENARDO B P 1962 NASA-AMES TN-D-1210 AD-273315
MEASUREMENTS OF MOMENTUM TRANSFER FROM PLASTIC PROJECTILES TO MASSIVE ALUMINUM TARGETS AT SPEEDS TO 25600 FEET PER SEC
- 1097 DENARDO B P 1966 NASA-AMES TN-D-3369
PENETRATION OF POLYETHYLENE INTO SEMI-INFINITE 2024-T351 ALUMINUM UP TO VELOCITIES OF 37,000 FEET PER SECOND
- 1098 DENARDO B P NYSMITH C R 1966 NASA-AMES
MOMENTUM TRANSFER AND CRATERING PHENOMENA ASSOCIATED WITH THE IMPACT OF ALUMINUM SPHERES INTO THICK ALUMINUM TARGETS AT VELOCITIES TO 24000 FEET PER SECOND
IN THE FLUID DYNAMIC ASPECTS OF SPACE FLIGHT AGARDOGRAPH 87-1 GORDON AND BREACH SCIENCE PUBLISHERS NEW YORK
- 1099 FISH R H SUMMERS J L 1965 NASA-AMES HVIS-7-6 N65-29392 AD-463232
THE EFFECT OF MATERIAL PROPERTIES ON THRESHOLD PENETRATION
- 450 GAULT D E HEITOWITZ E D 1963 NASA-AMES HVIS-6-2-2 AD-423064
THE PARTITION OF ENERGY FOR HYPERVELOCITY IMPACT CRATERS FORMED IN ROCK
- 1100 GAULT D E MOORE H J 1965 NASA-AMES HVIS-7-6 AD 463232
SCALING RELATIONSHIPS FOR MICROSCALE TO MEGASCALE IMPACT CRATERS
- 448 MACCORMACK R W 1963 NASA-AMES HVIS-6-2-2 AD-423064
INVESTIGATION OF IMPACT FLASH AT LOW AMBIENT PRESSURES
- 1101 NYSMITH C R DENARDO B P 1966 NASA-AMES TN-D-3304
INVESTIGATION OF THE IMPACT OF HIGH-FINENESS-RATIO PROJECTILES INTO THICK TARGETS
- 33 NYSMITH C R SUMMERS J L 1961 NASA-AMES TN-D-1039
PRELIMINARY INVESTIGATION OF IMPACT ON MULTIPLE SHEET-STRUCTURES AND AN EVALUATION OF THE METEOROID HAZARD TO SPACE VEHICLES
- 447 NYSMITH C R SUMMERS J L 1962 NASA-AMES TN-D-1431 N62-16839
AN EXPERIMENTAL INVESTIGATION OF THE IMPACT RESISTANCE OF DOUBLE-SHEET STRUCTURES AT VELOCITIES TO 24000 FEET PER SECOND
- 449 NYSMITH C R ET AL 1964 NASA-AMES TN-D-1981
INVESTIGATION OF THE IMPACT OF COPPER FILAMENTS INTO ALUMINUM TARGETS AT VELOCITIES TO 16000 FEET PER SECOND
SEE ALSO HVIS-6-2-2
- 1103 SCHMIDT R A ET AL 1965 NASA-AMES HVIS-7-5 AD-463231
ELECTRON MICROPROBE STUDY OF A CRATER AND EJECTA PRODUCED BY HYPERVELOCITY IMPACT AGAINST A NI-FE TARGET
- 30 SUMMERS J L 1959 NASA-AMES TN-D-0094
INVESTIGATION OF HIGH-SPEED IMPACT - REGIONS OF IMPACT AND IMPACT AT OBLIQUE ANGLES

1104 SUMMERS J L 1966 NASA-AMES
EVALUATION OF THE IMPACT PERFORMANCE OF REALISTIC SPACE STRUCTURES
IN THE FLUID DYNAMIC ASPECTS OF SPACE FLIGHT AGARDOGRAPH 87-1
GORDON AND BREACH SCIENCE PUBLISHERS NEW YORK

27 SUMMERS J L CHARTERS A 1958 NASA-AMES HVIS-3-1 AD-233487
HIGH-SPEED IMPACT OF METAL PROJECTILES IN TARGETS OF VARIOUS MATERIALS

31 SUMMERS J L NIEHAUS W R 1959 NASA-AMES TN-D-0137
A PRELIMINARY INVESTIGATION OF THE PENETRATION OF SLENDER METAL RODS IN
THICK METAL TARGETS

NASA-GODDARD

454 ALEXANDER W M BERG O E 1961 NASA-GODDARD HVIS-5-1-2 N62-16580
MICRO-PARTICLE HYPERVELOCITY IMPACTS FROM RANGER I

NASA-LANGLEY

1237 CARTER D J JR 1960 NASA-LANGLEY TN-D-442
A PRELIMINARY INVESTIGATION OF THE DESTRUCTION OF SOLID-PROPELLANT ROCKET
MOTORS BY IMPACT FROM SMALL PARTICLES

35 COLLINS R D KINARD W H 1960 NASA-LANGLEY TN-D-0238
THE DEPENDENCY OF PENETRATION ON THE MOMENTUM PER UNIT AREA OF THE
IMPACTING PROJECTILE AND THE RESISTANCE OF MATERIALS TO PENETRATION

463 DAVIDSON J R ET AL 1963 NASA-LANGLEY TN-D-1493
ENVIRONMENTAL PROBLEMS OF SPACE FLIGHT STRUCTURES II METEOROID HAZARD

1105 DI BATTISTA J D 1966 NASA-LANGLEY TN-D-3618
AN INVESTIGATION OF SPRAY VELOCITY RESULTING FROM HIGH-VELOCITY
PENETRATION OF THIN PLATES BY DISKS

39 FUNKHOUSER J O 1961 NASA-LANGLEY TN-D-0802
A PRELIMINARY INVESTIGATION OF THE EFFECT OF BUMPERS AS A MEANS OF
REDUCING PROJECTILE PENETRATION

465 HUMES D H 1963 NASA-LANGLEY TN-D-1784
AN EXPERIMENTAL INVESTIGATION OF THE EFFECTIVENESS OF SINGLE ALUMINUM
METEOROID BUMPERS

461 HUMES D ET AL 1961 NASA-LANGLEY HVIS-5-1-2 N62-16575
AN EXPERIMENTAL INVESTIGATION OF SINGLE ALUMINUM METEOR BUMPERS

38 KINARD W H COLLINS R D 1961 NASA-LANGLEY TN-D-0726
AN INVESTIGATION OF HIGH-VELOCITY IMPACT CRATERING INTO NONMETALLIC
TARGETS AND CORRELATION OF PENETRATION DATA FOR METALLIC AND NONMETALLIC
TARGETS

34 KINARD W H ET AL 1958 NASA-LAN MEMO-10-18-58L
EFFECT OF TARGET THICKNESS ON CRATERING AND PENETRATION OF PROJECTILES
IMPACTING AT VELOCITIES TO 13000 FEET PER SECOND

- 1239 KRUSZEWSKI E T HAYDUK R 1967 NASA-LANGLEY A67-23700
IMPLICATIONS OF THE METEOROID ENVIRONMENT ON THE DESIGN OF SPACECRAFT
PAPER PRESENTED AT AIAA/ASME 8TH STRUCTURES, STRUCTURAL DYNAMICS AND
MATERIALS CONFERENCE, PALM SPRINGS, CALIFORNIA, MARCH 29-31, 1967
PUBLISHED BY AIAA
- 1106 THOMSON R G 1965 NASA-LANGLEY TR-R-221
ANALYSIS OF HYPERVELOCITY PERFORATION OF A VISCO-PLASTIC SOLID INCLUDING
THE EFFECTS OF TARGET-MATERIAL YIELD STRENGTH
- 1107 THOMSON R G KRUSZEWSKI 1965 NASA-LANGLEY HVIS-7-5 AD-463231
EFFECT OF TARGET MATERIAL YIELD STRENGTH ON HYPERVELOCITY PERFORATION
AND BALLISTIC LIMIT
- 1108 TIPPENS P E DAVIDSON J 1966 NASA-LANGLEY TN-D-3631
DETERMINATION OF TEMPERATURE AND MATERIAL EFFECTS ON HIGH-VELOCITY IMPACT
CRATERS IN ABLATIVE HEAT-SHIELD MATERIALS
- NASA-LEWIS
- 1109 CLOUGH N ET AL 1966 NASA-LEWIS TN-D-3468
DIMPLE, SPALL, AND PERFORATION CHARACTERISTICS IN ALUMINUM, COLUMBIUM,
AND STEEL PLATES UNDER HYPERVELOCITY IMPACT
- 1110 DIEDRICH J H STEPKA F S 1965 NASA-LEWIS TN-D-2720
INVESTIGATION OF DAMAGE TO BRITTLE MATERIALS BY IMPACT WITH HIGH-VELOCITY
PROJECTILES INTO GLASS AND LUCITE
- 1111 DIEDRICH J H ET AL 1965 NASA-LEWIS TN-D-3018 N65-33838
HYPERVELOCITY IMPACT DAMAGE CHARACTERISTICS IN BERYLLIUM AND GRAPHITE
PLATES AND TUBES
- 1112 DIEDRICH J H ET AL 1965 NASA-LEWIS HVIS-7-6 AD-463232
BRITTLE BEHAVIOR OF BERYLLIUM, GRAPHITE, AND LUCITE UNDER HYPERVELOCITY
IMPACT
- 1113 LIEBLEIN S ET AL 1964 NASA-LEWIS TN-D-2472
HYPERVELOCITY IMPACT DAMAGE CHARACTERISTICS IN ARMORED SPACE RADIATOR
TUBES
- 1114 MORSE C R STEPKA F S 1966 NASA-LEWIS TN-D-3627
EFFECT OF PROJECTILE SIZE AND MATERIAL ON IMPACT FRACTURE OF WALLS OF
LIQUID FILLED TANKS
- 1115 STEPKA F S 1966 NASA-LEWIS TN-D-3456
PROJECTILE-IMPACT-INDUCED FRACTURE OF LIQUID-FILLED FILAMENT-REINFORCED
PLASTIC OR ALUMINUM TANKS
- 1116 STEPKA F S MORSE C R 1963 NASA-LEWIS TN-D-1537
PRELIMINARY INVESTIGATION OF CATASTROPHIC FRACTURE OF LIQUID-FILLED TANKS
IMPACTED BY HIGH-VELOCITY PARTICLES
- 1117 STEPKA F S ET AL 1965 NASA-LEWIS TN-D-3143
INVESTIGATION OF CHARACTERISTICS OF PRESSURE WAVES GENERATED IN WATER
FILLED TANKS IMPACTED BY HIGH-VELOCITY PROJECTILES
- 1118 STEPKA F S ET AL 1965 NASA-LEWIS HVIS-7-6 AD-463232
INVESTIGATION OF CATASTROPHIC FRACTURING AND CHEMICAL REACTIVITY OF
LIQUID-FILLED TANKS WHEN IMPACTED BY PROJECTILES OF HIGH VELOCITY

NASA-MARSHALL

1119 DALTON C C 1964 NASA-MARSHALL TN-D-1996
ESTIMATION OF TOLERANCE LIMITS FOR METEOROID HAZARD TO SPACE VEHICLES
100-500 KILOMETERS ABOVE THE SURFACE OF THE EARTH

1120 DALTON C C 1966 NASA-MARSHALL TMX-53512 N66-38943
EFFECTS OF RECENT NASA-ARC HYPERVELOCITY IMPACT RESULTS ON METEOROID
FLUX AND PUNCTURE MODELS

457 GAYLE J B ET AL 1963 NASA-MARSHALL TMX-56505 N65-25011
A BIBLIOGRAPHY CONCERNING ASPECTS OF THE METEOROID HAZARD

1234 NAUMANN R J 1965 NASA-MARSHALL HVIS-7-4 AD-463230
A PHYSICAL BASIS FOR SCALING HYPERVELOCITY IMPACT

NATIONAL BUREAU OF STANDARDS - WASHINGTON, DC

1121 ENGEL O G 1962 WADD(NBS) TR-60-475-2 AD-408984
CRATER DEPTH IN FLUID IMPACTS

441 ENGEL O G 1963 HVIS-6-2-2 AD-423064
HYPERVELOCITY CRATERING DATA AND A CRATER-DEPTH MODEL FOR THE REGIME OF
FLUIDITY

1122 ENGEL O G 1966 WADD(NBS) TR-60-475-2-1 AD-641302
COLLISIONS OF LIQUID DROPS WITH LIQUIDS - SUPPLEMENT I
NEW CRATER DEPTH DATA FOR IMPACTS OF WATERDROPS WITH WATER

1123 ENGEL O G 1966 WADD(NBS) TR-60-475-3 AD 643237
COLLISIONS OF LIQUID DROPS WITH LIQUIDS - PART III
IMPACT CRATERING IN THE HYPERVELOCITY RANGE

U.S. NAVAL ORDNANCE LABORATORY - WHITE OAK, MARYLAND

481 LUTTRELL J L 1963 NOL HVIS-6-2-1 AD-423063
A HYPERVELOCITY IMPACT MODEL FOR COMPLETELY DEFORMING PROJECTILES

1124 PIACESI R ET AL 1964 NOL AIAA J 2-11 2040-2042
TEMPERATURE YIELD STRENGTH CORRELATION IN HYPERVELOCITY IMPACT

1125 PIACESI R ET AL 1965 NOL HVIS-7-5 AD-463231
DETERMINATION OF THE YIELD STRENGTH AS AN EFFECTIVE MECHANICAL STRENGTH
PROPERTY IN THE CRATERING PROCESS OF HYPERVELOCITY IMPACT

1126 PIACESI R ET AL 1966 NOL TR-66-42 AD-641874
A STUDY OF THE ROLE OF MECHANICAL-STRENGTH PROPERTIES ON THE PHENOMENA
OF SPALLATION

U.S. NAVAL ORDNANCE TEST STATION - CHINA LAKE, CALIFORNIA

144 ALLEN W A ET AL 1958 NOL HVIS-3-1 AD-233487
FLUID MECHANICS OF COPPER

U.S. NAVAL RESEARCH LABORATORY

50 ATKINS W W	1958	NRL	HVIS-3-1	AD-233487
HYPERVELOCITY PENETRATION STUDIES				
51 ATKINS W W	1960	NRL	HVIS-4-1	AD-244475
HYPERVELOCITY PENETRATION STUDIES				
514 HALPERSON S M	1963	NRL	HVIS-6-2-2	AD-423064
SOME PHENOMENA ASSOCIATED WITH IMPACTS INTO ALUMINUM				
1127 HALPERSON S M	1965	NRL	HVIS-7-5	AD-463231
COMPARISONS BETWEEN HYDRODYNAMIC THEORY AND IMPACT EXPERIMENTS				
510 HALPERSON S M	ATKINS W	1961	NRL	HVIS-5-1-2 N62-16571
EXPERIMENTAL OBSERVATIONS OF IMPACT				
1128 HALPERSON S ET AL	1960	NRL	HVIS-4-3	AD-244477
HIGH-VELOCITY-PROJECTILE DRAG DETERMINATION				

NORTH AMERICAN AVIATION, INC - DOWNEY

1129 POSEVER F C SCULLY C N	1964	FDL(NAA-DOWNEY) TRD-64-96		AD-602512
INVESTIGATION OF STRUCTURAL IMPLICATIONS OF METEOROID IMPACT				
1130 POSEVER F C ET AL	1965	NAA-DOWNEY J SPACECRAFT 2-5 738-741		
IMPACT EFFECTS ON METEOROID SHIELDING CONFIGURATIONS FOR VELOCITIES UP				
TO 60,000 FPS				
1131 ROSEN F D SCULLY C N	1965	NAA-DOWNEY	HVIS-7-6	AD-463232
IMPACT FLASH INVESTIGATIONS TO 15.4 KM/SEC				

NORTHROP CORPORATION - HAWTHORNE

540 D'ANNA P J	1963	NORTHROP-HAW	HVIS-6-3	N63-15390 AD-423802
HYPERVELOCITY PUNCTURING OF SELF-SEALING STRUCTURES				
1132 D'ANNA P J HEITZ R M	1966	NORTHROP-HAW	CR-485	
EVALUATION OF SELF SEALING STRUCTURES FOR SPACE VEHICLE APPLICATION				
NASA CONTRACT NASR-102				

PENNSYLVANIA MILITARY COLLEGE

1133 DITARANTO R A	1966	PENN MIL COL	MEL-RD-R-37-66	AD-629785
A SHORT SURVEY OF VISCOELASTIC THEORY				

PENNSYLVANIA STATE UNIVERSITY

1134 DAVIDS N (ED)	1960	BOOK		
INTERNATIONAL SYMPOSIUM ON STRESS WAVE PROPAGATION IN MATERIALS				
INTERSCIENCE PUBL, N Y				
1135 DAVIDS N HUANG Y K	1962	PENN STATE U J AEROSP SCI	29-5 550-557	
SHOCK WAVES IN SOLID CRATERS				

- 545 DAVIUS N ET AL 1961 PENN STATE U HVIS-5-1-1 N62-16555
SOME THEORETICAL MODELS OF HYPERVELOCITY
- 547 DAVIUS N ET AL 1963 PENN STATE U HVIS-6-2-1 AD-423063
SPHERICAL SHOCK WAVES AND CAVITY FORMATION IN METALS
- 1136 DAVIUS N ET AL 1965 PENN STATE U HVIS-7-3 AD-463229
A PENETRATION METHOD FOR DETERMING IMPACT YIELD STRENGTH
- PICATINNY ARSENAL
- 55 CLARK E N ET AL 1960 PICATINNY AR HVIS-4-1 AD-244475
STUDIES OF HYPERVELOCITY IMPACT ON LEAD
- RAND CORPORATION
- 128 BJORK R L 1958 RAND P-1662 AD-224147
EFFECTS OF A METEOROID IMPACT ON STEEL AND ALUMINUM IN SPACE
- 582 BJORK R L 1958 RAND S-103 AD-305657
NUMERICAL SOLUTIONS OF THE AXIALLY SYMETRIC HYPERVELOCITY IMPACT
PROCESS INVOLVING IRON(U) (CONFIDENTIAL REPORT)
- 152 BJORK R L 1961 RAND J GEOPHY RES 66-10 3379-3387
ANALYSIS OF THE FORMATION OF METEOR CRATER, ARIZONA-A PRELIMINARY REPORT
- 1137 BJORK R L 1962 RAND ARS J 32-9 1471-1472
REVIEWER'S COMMENT (ON 1960 STANUKOVICH ARTICLE)
- 580 BJORK R L 1963 RAND RM-3529-PR N63-19789
REVIEW OF PHYSICAL PROCESSES IN HYPERVELOCITY IMPACT AND PENETRATION
ALSO IN HVIS-6-2-1 AD-423063
- 576 BJORK R L GAZLEY C JR 1959 RAND RM-2332
ESTIMATED DAMAGE TO SPACE VEHICLES BY METEOROIDS
- 1138 BJORK R L OLSHAKER A E 1965A RAND RM-2926-PR AD-617339
A PROPOSED SCALING LAW FOR HYPERVELOCITY IMPACTS BETWEEN A PROJECTILE AND
A TARGET OF DISSIMILAR MATERIAL
- 1139 BJORK R L OLSHAKER A E 1965B RAND RM-3490-PR AD-617549
THE ROLE OF MELTING AND VAPORIZATION IN HYPERVELOCITY IMPACT
- 1140 BJORK R L ET AL 1963 RAND RM-2628-PR AD-425951
A NUMERICAL TECHNIQUE FOR SOLUTION OF MULTIDIMENSION HYDRODYNAMIC PROBLEMS
- 1141 BRODE H L BJORK R L 1961 RAND UCRL-6438
CRATERING FROM A MEGATON SURFACE BURST
- 1142 KAPLAN M A PAPETTI R A 1966 RAND RM-4876-PR AD-641655
AN ANALYSIS OF THE TWO-DIMENSIONAL PARTICLE-IN-CELL METHOD
- 1143 MCCLOSKEY D J 1964 RAND RM-3905-PR AD-429196
AN ANALYTIC FORMULATION OF EQUATIONS OF STATE
- 578 OLSHAKER A E BJORK R L 1961 RAND HVIS-5-1-1 N62-16558
HYDRODYNAMICS APPLIED TO HYPERVELOCITY IMPACT -
I - SCALING LAWS FOR DISSIMILAR MATERIALS

- 1144 OLSHAKER A E BJORK R L 1961 RAND HVIS-5-1-1 N62-16559
 HYDRODYNAMICS APPLIED TO HYPERVELOCITY IMPACT -
 II - THE ROLE OF MELTING AND VAPORIZATION IN HYPERVELOCITY IMPACT
 REPUBLIC AVIATION CORPORATION
- 1145 RIEDER Z 1959 AFSWC(REFUBLIC) TM-60-3 AD-606342
 SURVEY OF SPALLATION LITERATURE
- RHEEM MANUFACTURING COMPANY
- 57 MCKENZIE R J ET AL 1958 RHECM HVIS-3-1 AD-233487
 HIGH VELOCITY IMPACT OF SMALL METAL SPHERES UPON FLAT METAL TARGETS
- SANDIA CORPORATION
- 1146 BUTCHER B M ET AL 1964 SANDIA AIAA J 2-6 977-990
 INFLUENCE OF STRESS HISTORY ON TIME-DEPENDENT SPALL IN METALS
- SHOCK HYDRODYNAMICS INC
- 1147 BJORK R L ROSENBLATT M 1965 SHOCK HYDRO HVIS-7-4 AD-463230
 HYPERVELOCITY IMPACT OF END-ORIENTED RODS
- 1001 KREYENHAGEN K N ZERNOW 1961 AEROJ HVIS-5-1-2 N62-16578 -
 NUMERICAL SOLUTION OF OBLIQUE IMPACTS
- 1149 WAGNER M H ET AL 1965 SHOCK HYDRO HVIS-7-3 AD-463229
 IMPACT OF A POROUS ALUMINUM PROJECTILE ON ALUMINUM AT 20 AND 72 KM/SEC
- SPACE TECHNOLOGY LABORATORIES - SEE TRW
- STANFORD RESEARCH INSTITUTE
- 60 ANDERSON G D ET AL 1958 SRI-PL HVIS-3-1 AD-233487
 CRATERING BY HIGH VELOCITY MICROPARTICLES
- 1150 DORAIN D G LINDE R K 1965 SRI POULT LAB TR-004-65 AD-479462
 SHOCK WAVES IN SOLIDS
- 1151 NAAR J 1964 SRI DASA-1285-1
 NUCLEAR GEOPLOSTICS - A SOURCEBOOK OF UNDERGROUND PHENOMENA AND EFFECTS
 OF NUCLEAR EXPLOSIONS
 PART 1 - THEORY OF DIRECTLY-INDUCED GROUND MOTION
- 1152 SAUER F M ET AL 1964 SRI DASA-1285-4
 NUCLEAR GEOPLOSTICS - A SOURCEBOOK OF UNDERGROUND PHENOMENA AND EFFECTS
 OF NUCLEAR EXPLOSIONS
 PART 4 - EMPIRICAL ANALYSIS OF GROUND MOTION AND CRATERING
- STANFORD UNIVERSITY
- 1153 GOODIER J N 1965 STANFORD U HVIS-7-3 AD-463229
 ON THE MECHANICS OF INDENTATION AND CRATERING IN SOLID TARGETS OF STRAIN-HARDENING METAL BY IMPACT OF HARD AND SOFT SPHERES

STEVENS INSTITUTE OF TECHNOLOGY

1154 BORG S F 1966 STEVENS INST TECH A67-11444
A NEW MODEL OF HYPERVELOCITY IMPACT GOVERNING CRATER FORMATION
PAPER PRESENTED AT 17TH INST ASTRO CONGRESS, MADRID, OCT 9-15, 1966

TECHNICAL OPERATIONS INC - BURLINGTON

1155 ROLSTEN R F 1965 TECH OPS AIAA J 3-11 2149-2151
HYPERVELOCITY CRATER DEPTH AND TARGET STRENGTH

1156 ROLSTEN R F ET AL 1966 NATURE 212-5061 495-497
HYPER-VELOCITY CRATER SIZE AND TARGET STRENGTH

597 SCHERRER V E 1962 ASD(TECH OPS) TDR-62-762 AD-286915
EFFECTS OF HYPERVELOCITY IMPACTS ON MATERIALS

TECHNIK INC

1157 MARSELL P ET AL 1965 TECHNIK HVIS-7-3 AD-463229
HYPERVELOCITY IMPACT - A SERIES SOLUTION

119 ZAID M 1960 TECHNIK HVIS-4-3 AD-244477
AN ANALYTICAL APPROACH TO HYPERVELOCITY IMPACT MECHANICS

600 ZAID M 1961 TECHNIK HVIS-5-1-1 N62-16560
PENETRATION BY HYPERVELOCITY PARTICLES

TEMPLE UNIVERSITY

635 FUCHS O P 1963 TEMPLE U AIAA J 1-9 2124-2126
IMPACT PHENOMENA

TRW - SPACE TECHNOLOGY LABORATORIES

588 FRIICHTENICHT J SLATTERY 1963 TRW-STL HVIS-6-2-2 AD-423064
IONIZATION ASSOCIATED WITH HYPERVELOCITY IMPACT
SEE ALSO NASA TN-D-2091

56 FRIICHTENICHT HAMMERMESH 1960 TRW HVIS-4-3 AD-244477
BALLISTIC IMPACTS BY MICROSCOPIC PROJECTILES

1158 SLATTERY J C 1966 TRW 03246-6001-R000 N67-16639
EXPERIMENTAL RESEARCH ON HYPERVELOCITY CRATERING BY MICROSCOPIC PARTICLES

UNITED AIRCRAFT CORPORATION

604 KRAUS H 1963 UA-PW-CN HVIS-6-3 AD-423R02
TWO DIMENSIONAL ANALYSIS OF A HYPERVELOCITY IMPACT UPON A VISCO-PLASTIC PLATE

UNIVERSITY OF CALIFORNIA - BERKELEY

1159 GOLDSMITH W 1963 U CALIF BERKLEY APPL MECH REV 16-11 855-866
IMPACT - THE COLLISION OF SOLIDS

UNIVERSITY OF CALIFORNIA - LAWRENCE RADIATION LABORATORY

1160 NORDYKE M D (EL) 1961 UCRL UCRL-6438
PROCEEDINGS OF THE GEOPHYSICAL LABORATORY - LAWRENCE RADIATION LABORATORY CRATERING SYMPOSIUM

430 WILKINS M L GIROUX R 1963 UCRL UCRL-7271
THE CALCULATION OF STRESS WAVES IN SOLIDS
ALSO IN HVIS-6-2-1

AD-423063

UNIVERSITY OF MICHIGAN

1161 PITEK M T HAMMITT F G 1966 U MICHIGAN 08153-1-T AD-803278
HYPERVELOCITY AND FLUID IMPACT STUDIES - A LITERATURE SURVEY

UNIVERSITY OF TEXAS

1162 YUAN S W BLOOM A M 1964 U TEXAS AIAA J 2-9 1667-1669
AN ANALYTICAL APPROACH TO HYPERVELOCITY IMPACT

1163 YUAN S W BLOOM A M 1965 U TEXAS AIAA J 3-7 1373-1374
REPLY BY AUTHORS TO T A ZAKER

1164 YUAN S W COURTER R W 1965 U TEXAS HVIS-7-3 AD-463229
AN INVESTIGATION OF CRATER FORMATION BY HYPERVELOCITY IMPACT

UNIVERSITY OF UTAH

1165 COOK M A 1958 U UTAH BOOK
THE SCIENCE OF HIGH EXPLOSIVES
REINHOLD PUBL CORP, N Y

77 COOK M A KEYES R T 1958 U UTAH HVIS-3-1 AD-233487
MICROSECOND FRAMING CAMERA OBSERVATIONS OF HIGH VELOCITY IMPACT

83 GROW R W ET AL 1960 U UTAH HVIS-4-3 AD-244477
EXPERIMENTAL INVESTIGATION OF SPRAY PARTICLES PRODUCING THE IMPACT FLASH

81 KEYES R T ET AL 1960 U UTAH HVIS-4-3 AD-244477
FRAMING CAMERA OBSERVATIONS OF ULTRA-HIGH VELOCITY PENETRATION IN
TRANSPARENT TARGETS AND A MECHANISM FOR CRATER EXPANSION

82 PALMER L P ET AL	1960 U UTAH	HVIS-4-1	AD-244475
CRATERING - EXPERIMENT AND THEORY			
69 PARTRIDGE W S	1958 U UTAH	HVIS-2-1	AD-201902
HIGH-VELOCITY IMPACT STUDIES AT THE UNIVERSITY OF UTAH			
75 PARTRIDGE W S ET AL	1958 U UTAH	HVIS-3-1	AD-2334877
PERFORATION AND PENETRATION EFFECTS OF THIN TARGETS			
76 VANFLEET H B ET AL	1958 U UTAH	HVIS-3-1	AD-233487
THE ANOMALOUS BEHAVIOR OF LEAD-TO-LEAD IMPACT			

UTAH RESEARCH AND DEVELOPMENT CO

1247 LEE T W	1964 ATL(UTAH RDC) TDR-64-24		AD-445704
STUDY OF PHENOMENA RESULTING FROM HYPERVELOCITY IMPACT			
626 LEE T ET AL	1961 UTAH RDC	HVIS-5-1-2 N62-16574	
SPRAY PARTICLE TECHNIQUE FOR STUDYING HYPERVELOCITY IMPACT			
1166 PALMER E P TURNER G H	1965 UTAH RDC	HVIS-7-5	AD-463231
ENERGY PARTITIONING IN HIGH-VELOCITY-IMPACT CRATERING IN LEAD			
1167 SORENSEN N R	1965 UTAH RDC	HVIS-7-6	AD-463232
SYSTEMATIC INVESTIGATION OF CRATER FORMATION IN METALS			

WATERTOWN ARSENAL

89 ABBUT K H	1960 WATERTOWN AR	HVIS-4-2	AD-244476
METALLURGICAL OBSERVATIONS OF HIGH SPEED IMPACT			

WATERVLIET ARSENAL

1168 DUNN W P	1966 WVT	WVT-6609	AD-637136
ON THE INITIAL CONDITIONS OF THE HYPERVELOCITY IMPACT OF A SPHERICAL PROJECTILE ON A SEMI-INFINITE TARGET			
1169 DUNN W P	1966 WVT	AIAA J 4-3 535-536	
ON MATERIAL STRENGTHS OF THE HYPERVELOCITY IMPACT PROBLEM			

MISCELLANEOUS U.S.

1170 ANON	1963 ASD	TDR-63-140	AD-408777
PROCEEDING OF SYMPOSIUM ON STRUCTURAL DYNAMICS UNDER HIGH IMPULSE LOADING, DAYTON, OHIO, SEPT 1962			
1171 ANON	1966 AGARD		
THE FLUID DYNAMIC ASPECTS OF SPACE FLIGHT AGARDOGRAPH 87-1			
PROC AGARD-NATO SPECIALISTS' MEETING SPONSORED BY THE FLUID DYNAMICS PANEL OF AGARD, MARSEILLE, FRANCE, APRIL 20-24, 1964			
GORDON AND BREACH SCIENCE PUBLISHERS NEW YORK			
1243 BATSON R G HYDE J H	1931		
MECHANICAL TESTING - VOLUME 1 - TESTING OF MATERIALS OF CONSTRUCTION			
E P DUTTON AND COMPANY, NEW YORK			

- 1172 COSBY W A LYLE R G 1965 NAS-NRC SP-78
THE METEOROID ENVIRONMENT AND ITS EFFECTS ON MATERIALS AND EQUIPMENT
- 1173 DAVIS D M 1963 ASD-WL-EGLIN HVIS-6-3 AD-423802
SUMMARY - THIN PLATE PERFORATION AND PROTECTION
- 1174 FERRY J D 1961 BOOK
VISCOELASTIC PROPERTIES OF POLYMERS
JOHN WILEY AND SONS, INC, N Y
- 1244 LESSELLS J M 1954
STRENGTH AND RESISTANCE OF METALS
JOHN WILEY AND SONS, INC, NEW YORK
- 1245 LYSAGHT V E 1949
INDENTATION HARDNESS TESTING
REINHOLD PUBLISHING CORP, NEW YORK
- 93 RINEHART J S PEARSON J 1954 NOTS BOOK
BEHAVIOR OF METALS UNDER IMPULSIVE LOADS
PUBLISHED BY ASM, CLEVELAND, OHIO
- 1175 SHEWMON P G ZACKAY V F 1961 INTERSCIENCE PUBLISHERS N Y
RESPONSE OF METALS TO HIGH VELOCITY DEFORMATION
- 1176 WESTBROOK J H 1953 GE-SCH TRANS ASM 45 221-248
TEMPERATURE DEPENDENCE OF THE HARDNESS OF PURE METALS
GORDON AND BREACH SCIENCE PUBLISHERS NEW YORK

PROCEEDINGS OF THE FIRST SEVEN SYMPOSIA ON HYPERVELOCITY IMPACT

1177 HVIS-1	SECRET REPORT	1955	AFOSR	AD-079284
1178 HVIS-2-1		1957	NRL/ARDC	AD-201902
1179 HVIS-2-2	CONF REPORT	1957	NRL/ARDC	AD-301552
1180 HVIS-3-1		1959	ARF	AD-233487
1181 HVIS-3-2	SECRET REPORT	1959	ARF	AD-315486
1182 HVIS-4-1		1960	APGR	TR-60-39-1 AD-244475
1183 HVIS-4-2		1960	APGR	TR-60-39-2 AD-244476
1184 HVIS-4-3		1960	APGR	TR-60-39-3 AD-244477
1185 HVIS-4-5	SECRET REPORT	1960	APGR	TR-60-39-5 AD-321455
1186 HVIS-5-1-1		1962	COLORADO SCHOOL MINES	N62-16548
1187 HVIS-5-1-2		1962	COLORADO SCHOOL MINES	N62-16564
1188 HVIS-5-2		1962	COLORADO SCHOOL MINES	
1189 HVIS-6-1		1963	FIRESTONE-CLEVELAND	
1190 HVIS-6-2-1		1963	FIRESTONE-CLEVELAND	AD-423063
1191 HVIS-6-2-2		1963	FIRESTONE-CLEVELAND	AD-423064
1192 HVIS-6-3		1963	FIRESTONE-CLEVELAND	AD-423802
1193 HVIS-6-4	SECRET REPORT	1963	FIRESTONE-CLEVELAND	AD-345054
1194 HVIS-7-1	TECHNIQUES	1965	MARTIN-ORLANDO	AD-463227
1195 HVIS-7-2	THEORY	1965	MARTIN-ORLANDO	AD-463228
1196 HVIS-7-3	THEORY	1965	MARTIN-ORLANDO	AD-463229
1197 HVIS-7-4	THEORY	1965	MARTIN-ORLANDO	AD-463230
1198 HVIS-7-5	EXPERIMENTS	1965	MARTIN-ORLANDO	AD-463231
1199 HVIS-7-6	EXPERIMENTS	1965	MARTIN-ORLANDO	AD-463232
1200 HVIS-7-7	SECRET REPORT	1965	MARTIN-ORLANDO	AD-365243
1201 HVIS-7-8	SECRET REPORT	1965	MARTIN-ORLANDO	AD-365244

FOREIGN REPORTS

CANADA

- 1202 BACH G C LEE J H 1967 MCGILL U AIAA-P-67-141 A67-18290
SHOCK PROPAGATION IN SOLID MEDIA
- 1242 JEAN B 1966 AIAA J 4-10 1854-1856
EXPERIMENTAL OBSERVATIONS OF OPTICAL RADIATION ASSOCIATED WITH
HYPERVELOCITY IMPACT
- 12 MAIDEN C J ET AL 1960 CARDE HVIS-4-3 AD-244477
AN INVESTIGATION OF SPALLING AND CRATER FORMATION BY HYPERVELOCITY
PROJECTILES

FRANCE

- 1203 LECOMTE C L SCHALL R 1966 INST FR-AL RES ST-LOUIS FRANCE
ETUDE D'IMPACTS A GRANDE VITESSE A L'AIDE D'UN CANON A GAZ LEGER
IN THE FLUID DYNAMIC ASPECTS OF SPACE FLIGHT AGARDOGRAPH 87-1
GOROUN AND BREACH SCIENCE PUBLISHERS NEW YORK

UNITED KINGDOM

- ROYAL ARMAMENT RESEARCH AND DEVELOPMENT ESTABLISHMENT - FORT HALSTEAD
- 1204 CABLE A J 1966 ARDE ENGLAND
EXPERIMENTAL STUDIES OF HYPERVELOCITY IMPACT WITH THE R.A.R.D.E. 1/4 INCH
CALIBRE LAUNCHER
IN THE FLUID DYNAMIC ASPECTS OF SPACE FLIGHT AGARDOGRAPH 87-1
GOROUN AND BREACH SCIENCE PUBLISHERS NEW YORK
- 1205 HOPKINS H G 1961 ARDE HVIS-5-1-1 N62-16554
STUDIES OF HYPERVELOCITY IMPACT OF METALS
- 103 HOPKINS H G KOLSKY H 1960 ARDE HVIS-4-1 AD-244475
MECHANICS OF HYPERVELOCITY IMPACT OF SOLIDS
- 207 SMITH F ET AL 1961 ARDE HVIS-5-1-2 N62-16570
HYPERVELOCITY LAUNCHERS AND HYPERVELOCITY IMPACT EXPERIMENTS AT ARDE,
FORT HALSTEAD

OTHER UNITED KINGDOM PUBLICATIONS

- 205 JAMES H J BUCHANAN J S 1958 BRIT JSM HVIS-3-1 AD-233487
EXPERIMENTAL STUDIES OF PENETRATION BY SHAPED CHARGE JETS
- 1206 KOLSKY H 1953 IMP CHEM INDs OXFORD U PRESS LONDON
STRESS WAVES IN SOLIDS
- 1207 KOLSKY H 1958 APPL MECH REV 11-9 465-468
THE PROPAGATION OF STRESS WAVES IN VISCOELASTIC SOLIDS

- 1208 MOTT B W 1956 BOOK
MICRO-INDENTATION HARDNESS TESTING
BUTTERWORTHS SCI PUBL, LONDON
- 1209 O'NEILL H 1934 VICTORIA U BOOK
THE HARDNESS OF METALS AND ITS MEASUREMENT
CHAPMAN AND HALL, LTD, LONDON
- 1210 SNEDDON I N HILL R (ED) 1960 BOOK
PROGRESS IN SOLID MECHANICS - VOL 1
INTERSCIENCE PUBL, N Y

U.S.S.R.

- 1211 AL'TSHULER L V 1965 USSR SOV PHYS USPEKHI 8-1 52-91
USE OF SHOCK WAVES IN HIGH-PRESSURE PHYSICS
- 1212 AL'TSHULER L V ET AL 1959 USSR SOV PHYS DOKLADY 3 761-763
PHASE TRANSFORMATIONS OF WATER COMPRESSED BY STRONG SHOCK WAVES
- 1213 AL'TSHULER L V ET AL 1960 USSR SOV PHYS JETP 11-4 766-775
THE ISENTROPIC COMPRESSIBILITY OF ALUMINUM, COPPER, LEAD, AND IRON AT
HIGH PRESSURES
- 1214 ANDRIANKIN E I 1965 USSR J APPL MECH TECH PHY 1 88-92 AD-633118
REACTIVE IMPULSE AT LARGE SPEEDS OF IMPACT
- 1215 ANDRIANKIN E I 1966 USSR COSMIC RESEARCH 4-2 AD-640326
THE PENETRATION OF BARRIERS BY METEORITES
- 1216 ANDRIANKIN E I STEPANOV 1963 USSR PLANT SPACE SCI 11-11 1365-1373
THE DEPTH OF PENETRATION UPON IMPACT OF METEOR PARTICLES
- 1217 BAKANOVA A A ET AL 1965 USSR SOV PHYS SOLID STATE 7-6 1307-1313
COMPRESSION OF ALKALI METALS BY STRONG SHOCK WAVES
- 1218 BAUM F A ET AL 1959 USSR PHYSICS OF AN EXPLOSION AD-400151
US ARMY ENGR RES DEV LABS TRANSL T-1488(A-Q)
- 1219 BELYAKOV L V ET AL 1964 USSR SOVIET PHYS-TECH PHYS 8-8 736-739
COLLISION OF DEFORMABLE BODIES AND ITS MODELLING
II. THE MODELLING OF THE IMPACT OF A SPHERE AND A HALF-SPACE
- 1220 BELYAKOV L V ET AL 1964 USSR SOVIET PHYS-TECH PHYS 9-3 403-406
COLLISION OF DEFORMABLE BODIES AND ITS MODELLING
III. SIMILITUDE OF THE INSTANTANEOUS PARAMETER VALUES FOR THE ORIGINAL
AND MODELLING PROCESSES
- 1221 BELYAKOV L V ET AL 1965 USSR SOVIET PHYSICS-DOKLADY 10-1 69-71
THE ROLE OF THERMAL PHENOMENA IN COLLISIONS OF METALLIC BODIES
- 1222 GOGOLEV V M ET AL 1963 USSR J APPL MECH TECH PHY 5 AD-614773
APPROXIMATE EQUATION OF STATE OF SOLID BODIES
- 1223 KORMER S B ET AL 1962 USSR SOV PHYS JETP 15-3 477-488
DYNAMIC COMPRESSION OF POROUS METALS AND THE EQUATION OF STATE WITH
VARIABLE SPECIFIC HEAT AT HIGH TEMPERATURES

- 1224 KRUPNIKOV K K ET AL 1962 USSR SO. PHYS JETP 15-3 470-476
SHOCK COMPRESSION OF POROUS TUNGSTEN
- 1225 LIVANOV L B 1965 USSR COSMIC RES 3-4 529-530
COMPARISON OF EFFECTS OF METEORITE COLLISIONS WITH THE SURFACE OF METALS
- 1226 MUKHAMEDZHANOV A K 1966 USSR COSMIC RESEARCH 4-2 AD-640326
THE PENETRATION OF A THIN SHIELD BY A METEORITE
- 1227 RAYZER YU P 1964 USSR METEORITIKA 24 82-86 AD-614018
ON THE PROPAGATION OF A SHOCK WAVE IN THE GROUND DURING IMPACT OF A VERY FAST METEORITE AGAINST THE SURFACE OF THE PLANET
- 1228 RUSAKOV M M 1966 USSR PMTF JULY-AUG A66-42886
EXPERIMENTAL MODELLING OF A METEORITE IMPACT
- 1229 SADOVSKIY M A ET AL 1966 USSR SOVIET PHYS-DOKLADY 11-4 293-298
MODELING OF LARGE EJECTION EXPLOSIONS
- 1230 SAGOMONYAN A YA 1964 USSR SOVIET PHYSICS-DOKLADY 9-6 449-452
INTERACTION OF BODIES TRAVELLING AT VERY HIGH SPEEDS
- 134 STANYUKOVICH K P 1959 USSR SOVIET PHYSICS JETP 36(9)-5 1141
CONCERNING THE IMPACT OF SOLIDS AT HIGH VELOCITIES
- 605 STANYUKOVICH K P 1960 USSR ARTIFICIAL EARTH SATELLITES 4 86-117
ELEMENTS OF IMPACT THEORY FOR SOLID BODIES HAVING HIGH (COSMIC) SPEEDS
TRANSL IN ARS J 32-9 1459-1471 1962
- 133 STANYUKOVICH FEDYNKII 1947 USSR DOKLADY ACAD SCI SSSR 57-2 AD-124240
THE DESTRUCTIVE ACTION OF METEORITE IMPACTS
- 1231 VITMAN F F STEPANOV V A 1959 USSR FTD-MT-64-217 AD-605234
INFLUENCE OF STRAIN RATE ON RESISTANCE TO DEFORMATION OF METALS AT IMPACT
VELOCITIES OF 100 TO 1000 M/SEC
IN CERTAIN PROBLEMS OF THE STRENGTH OF SOLIDS ACAD SCI MOSCOW 207-221
- 1232 VITMAN F F ZLATIN N A 1964 USSR SOVIET PHYS-TECH PHYS 8-8 730-735
COLLISION OF DEFORMABLE BODIES AND ITS MODELLING
I. STATUS AND THEORY OF THE PROBLEM
- 1233 ZEL'DOVICH YA B ET AL 1959 USSR SOV PHYS DOKLADY 3 938-939
TEMPERATURE AND SPECIFIC HEAT OF PLEXIGLAS UNDER SHOCK WAVE COMPRESSION

RECENT ACQUISITIONS

- 1234 SEE NASA-MARSHALL
1235 SEE GENERAL MOTORS
1236 SEE CARNEGIE
1237 SEE NASA-LANGLEY
1238 SEE GENERAL MOTORS
1239 SEE NASA-LANGLEY
1240 SEE GE-PHILA
1241 SEE GE-SB
1242 SEE MISCELLANEOUS U.S.
1243 SEE CANADA
1244 SEE MISCELLANEOUS U.S.
1245 SEE MISCELLANEOUS U.S.
1246 SEE BATTELLE
1247 SEE UTAH RDC

APPENDIX B

ABBREVIATED BIBLIOGRAPHIC LISTINGS
ARRANGED BY SUBJECT CONTENT

B.1 REVIEWS OF HIGH SPEED IMPACT PHENOMENA

B.1.1 GENERAL REVIEWS

1042 ALI A	1963	GD/ASTRO	ERR-AN-167	
580 BJORK R L	1963	RAND	RM-3529-PR N63-19789	
1146 BUTCHER B M ET AL	1964	SANDIA	AIAA J 2-6 977-990	
32 CHARTERS A C	1960	NASA-AMES	SCI AMER 203-10 128-140	
1235 CHARTERS A C ET AL	1966	GM-SB		
1172 COSBY W A LYLE R G	1965	NAS-NRC	SP-78	
463 DAVIDSON J R ET AL	1963	NASA-LANGLEY	TN-D-1493	
1016 EICHELBERGER R J	1963	BRL	HVIS-6-2-2	AD-423064
1017 EICHELBERGER R GEHRING	1962	BRL	ARS J 32-10 1583-1590	
1069 GEHRING J W ET AL	1965	GM-SB	ASM-TR-W-13-5-65	
1068 GEHRING J W ET AL	1965	GM-SB	J SPACECRAFT 2-5 731-737	
1159 GOLDSMITH W	1963	U CALIF BERKLEY	APPL MECH REV 16-11 855-866	
438 HERRMANN W JONES A H	1961	MIT	ASRL-R-99-1	AD-267289
103 HOPKINS H G KOLSKY H	1960	ARDE	HVIS-4-1	AD-244475
1095 JONES A H ET AL	1963	MIT	ASRL-R-99-2	AD-432815
1007 KINSLOW R	1965	ARO	INT SCI TECH 40(APRIL)	
1207 KOLSKY H	1958		APPL MECH REV 11-9 465-468	
1053 KORNHAUSER M	1964		SPARTAN BKS INC BALTIMORE MD	
404 MAIDEN C J	1963	GM-SB	TR-63-203 N63-16482 AD-406169	
1145 RIEDER Z	1959	AFSWC(REPUBLIC)	TM-60-3	AD-606342
1089 ZUKAS E G	1966	LASL	METALS ENGR QUAR 6-2 1-20	

B.1.2 RESTRICTED SHORT REVIEWS

115 ALLISON F E	1958	CARNEGIE	HVIS-3-1	AD-233487
1011 ALLISON F E	1961	BRL	HVIS-5-1-1 N62-16553	
1064 CHRISTMAN D R GEHRING J	1966	GM-SB	J APPL PHYS 37-4 1579-1587	
1173 DAVIS D M	1963	ASD-WL-EGLIN	HVIS-6-3	AD-423802
1013 EICHELBERGER R J	1958	BRL	HVIS-3-1	AD-233487
1014 EICHELBERGER R J	1961	BRL	HVIS-5-1-2 N62-16564	
1015 EICHELBERGER R J	1961	BRL	HVIS-5-1-2 N62-16565	
7 GEHRING J W JR	1960	BRL	HVIS-4-2	AD-244476
440 HERRMANN W JONES A H	1963	ASD(MIT)	TDR-63-140	AD-408777
1003 ZERNOW L	1963	AEROJ	HVIS-6-3	AD-423802

B.2 BIBLIOGRAPHIES

1081 ANON	1964	ATD-LIB CONGR AID P-64-44	AD-602358
1082 ANON	1965	ATD-LIB CONGR P-65-1	AD-610054
1246 BELTON W L ET AL	1967	BATTELLE BAT-197A-21-2(REV 2)	AD-809916
1020 BERT C W ET AL	1963	BATTELLE BAT-197-16-1	AD-408386
1172 COSBY W A LYLE R G	1965	NAS-NRC	SP-78
457 GAYLE J B ET AL	1963	NASA-MARSHALL	TMX-56505 N65-25011
1021 GIDEON D N ET AL	1965	BATTELLE BAT-197-21-2(REV 1)	AD-463372
1085 GRAZIANO E MCCORMICK H	1963	LOCKHEED-MSC	SB-63-58
438 HERRMANN W JONES A H	1961	MIT	ASRL-R-99-1
1095 JONES A H ET AL	1963	MIT	ASRL-R-99-2
1083 KSANDER Y	1966	ATD-LIB CONG	REP-66-45
1084 PINDY F V	1966	ATD-LIB CONG	REP-66-60
* 1086 STROMER P R	1963	LOCKHEED-MSC	SB-63-31

B.3 HYPERVELOCITY IMPACT INTO THICK (SEMI-INFINITE) PLATES

B.3.1 EXPERIMENTAL STUDIES (INCLUDING SHORT SEMI-EMPIRICAL ANALYSES)

89	ABBOT K H	1960	WATERTOWN AR	HVIS-4-2	AD-244476
18	ALLISON F E ET AL	1960	CARNEGIE	HVIS-4-1	AD-244475
60	ANDERSON G D ET AL	1958	SRI-PL	HVIS-3-1	AD-233487
50	ATKINS W W	1958	NRL	HVIS-3-1	AD-233487
51	ATKINS W W	1960	NRL	HVIS-4-1	AD-244475
1219	BELYAKOV L V ET AL	1964	USSR SOVIET PHYS-TECH PHYS	8-8 736-739	
1221	BELYAKOV L V ET AL	1965	USSR SOVIET PHYSICS-DOKLADY	10-1 69-71	
1090	BOUMA D D BURKITT W C	1966	MARTIN-DENV	CR-664	
1204	CABLE A J	1966	RARDE ENGLAND		
23	CHARTERS A C LOCKE G S	1958	NACA-AMES	RM-A58B26	
29	CHARTERS A C SUMMERS J	1960	NOL(NASA-AMES)	NOLR-1238	
1062	CHRISTMAN D R GEHRING J	1965	GM-SB	TR-65-04	
1063	CHRISTMAN D R GEHRING J	1965	GM-SB	TR-65-50	
1064	CHRISTMAN D R GEHRING J	1966	GM-SB	J APPL PHYS 37-4 1579-1587	
55	CLARK E N ET AL	1960	PICATINNY AR	HVIS-4-1	AD-244475
35	COLLINS R D KINARD W H	1960	NASA-LANGLEY	TN-D-0238	
77	COOK M A KEYES R T	1958	U UTAH	HVIS-3-1	AD-233487
17	CULP F L	1958	CARNEGIE	HVIS-3-1	AD-233487
445	DENARDO B P	1962	NASA-AMES	TN-D-1210	AD-273315
1097	DENARDO B P	1966	NASA-AMES	TN-D-3369	
1098	DENARDO B P NYSMITH C R	1966	NASA-AMES		
1017	EICHELBERGER R GEHRING	1962	BRL	ARS J 32-10 1583-1590	
441	ENGEL O G	1963	HVIS-6-2-2		AD-423064
1123	ENGEL O G	1966	WADD(NBS)	TR-60-475-3	AD-643237
264	FRASIER J T KARPOV B G	1961	BROWN U	HVIS-5-1-2 N62-16567	
1018	FRASIER J T ET AL	1965	BRL	HVIS-7-5	AD-463231
56	FRIICHENICH H HAMMERMEHSH	1960	TRW	HVIS-4-3	AD-244477
450	GAULT D E HEITOWITZ E D	1963	NASA-AMES	HVIS-6-2-2	AD-423064
2	GEHRING J W JR	1958	BRL	HVIS-3-1	AD-233487
7	GEHRING J W JR	1960	BRL	HVIS-4-2	AD-244476
8	GEHRING J W RICHARDS L	1960	BRL	HVIS-4-3	AD-244477
1067	GEHRING J W ET AL	1965	GM-SB	HVIS-7-5	AD-463231
164	GOODMAN E H LILES C D	1963	ARO	HVIS-6-2-2	AD-423064
514	HALPERSON S M	1963	NRL	HVIS-6-2-2	AD-423064
1127	HALPERSON S M	1965	NRL	HVIS-7-5	AD-463231
510	HALPERSON S M ATKINS W	1961	NRL	HVIS-5-1-2 N62-16571	
1076	HAYES INT CORP	1964	ATL	TDR-64-51	AD-447004
1092	HERRMANN W JONES A H	1961	MIT	ASRL-R-99-1-A	AD-267290
38	KINARD W H COLLINS R D	1961	NASA-LANGLEY	TN-D-0726	
3	KINEKE J H JR	1958	BRL	HVIS-3-1	AD-233487
5	KINEKE J H JR	1960	BRL	HVIS-4-1	AD-244475
263	KINEKE J H JR	1961	BRL	HVIS-5-1-2 N62-16566	
266	KINEKE J H RICHARDS L G	1963	BRL	HVIS-6-2-2	AD-423064
267	KINEKE J H JR VITALI R	1963	BRL	HVIS-6-2-2	AD-423064
1203	LECOMTE C L SCHALL R	1966	INST FR-AL RES ST-LOUIS	FRANCE	
12	MAIDEN C J ET AL	1960	CARDE	HVIS-4-3	AD-244477
19	MAURER W C RINEHART J S	1960	COL SCH MINES	HVIS-4-3	AD-244477
57	MCKENZIE R J ET AL	1958	RHEEM	HVIS-3-1	AD-233487
1010	MCMATH R R	1966	AVCO-LOWELL	CR-65375 N66-27310	
1073	MEYERS C L ET AL	1964	GM-SB	TR-64-48 N65-33856	
446	MOORE H J ET AL	1961	GEOL SURV	HVIS-5-1-2 N62-16579	AD-423064
451	MOORE H J ET AL	1963	GEOL SURVEY	HVIS-6-2-2	
1074	MOORE H J ET AL	1965	GEOL SURV	HVIS-7-4	AD-463230
1166	PALMER E P TURNER G H	1965	UTAH RDC	HVIS-7-5	AD-463231

82	PALMER E P ET AL	1960	U UTAH	HVIS-4-1	AD-244475
69	PARTRIDGE W S	1958	U UTAH	HVIS-2-1	AD-201902
1009	PAYNE J J	1965	ARO	AEDC-TR-65-034 N65-16964	AD-456391
1124	PIACESI R ET AL	1964	NOL	AIAA J 2-11 2040-2042	
1125	PIACESI R ET AL	1965	NOL	HVIS-7-5	AD-463231
421	POND R B ET AL	1963	JOHN HOPKINS	HVIS-6-2-2	AD-423064
1129	POSEVER F C SCULLY C N	1964	FDL(NAA-DOWNEY)	TRD-64-96	AD-602512
219	ROCKOWITZ M ET AL	1961	AVCO-WIL	HVIS-5-1-2 N62-16573	
1043	ROLSTEN R F HUNT H H	1963	GD/ASTRO	AIAA J 1-8 1893-1895	
1046	ROLSTEN R F SCHMITT R	1963	CALIF WEST U	J APPL PHYS 34-10 3010-3012	
1156	ROLSTEN R F ET AL	1966	NATURE	212-5061 495-497	
1228	RUSAKOV M M	1966	USSR PMTF	JULY-AUG A66-42886	
597	SCHERRER V E	1962	ASD(TECH OPS)	TDR-62-762	AD-286915
1158	SLATTERY J C	1966	TRW	03246-6001-R000 N67-16639	
207	SMITH F ET AL	1961	ARDE	HVIS-5-1-2 N62-16570	
1167	SORENSEN N R	1965	UTAH RDC	HVIS-7-6	AD-463232
30	SUMMERS J L	1959	NASA-AMES	TN-D-0094	
27	SUMMERS J L CHARTERS A	1958	NASA-AMES	HVIS-3-1	AD-233487
1108	TIPPENS P E DAVIDSON J	1966	NASA-LANGLEY	TN-D-3631	
76	VANFLEET H B ET AL	1958	U UTAH	HVIS-3-1	AD-233487

B.3.2 EXTENSIVE ANALYSES OR CORRELATION STUDIES

580	BJORK R L	1963	RAND	RM-3529-PR N63-19789	
1090	BOUMA D D BURKITT W C	1966	MARTIN-DENV	CR-664	
376	BRUCE E P	1961	GE-PHILA	HVIS-5-1-2 N62-16569	AD-600668
1061	CHRISTMAN D R	1966	GM-SB	AIAA J 4-10 1872-1874	
441	ENGEL O G	1963	HVIS-6-2-2		AD-423064
1123	ENGEL O G	1966	WADD(NBS)	TR-60-475-3	AD-643237
1018	FRASIER J T ET AL	1965	BRL	HVIS-7-5	AD-463231
1127	HALPERSON S M	1965	NPL	HVIS-7-5	AD-463231
1075	HAYES INT CORP	1963	APGC	TDR-63-22	AD-401759
437	HERRMANN W JONES A H	1961	MIT	HVIS-5-1-2 N62-16568	
438	HERRMANN W JONES A H	1961	MIT	ASRL-R-99-1	AD-267289
210	HOENIG S A RITTER A	1957	ARMOUR	HVIS-2-1	AD-201902
1095	JONES A H ET AL	1963	MIT	ASRL-R-99-2	AD-432815
263	KINEKE J H JR	1961	BRL	HVIS-5-1-2 N62-16566	
12	MAIDEN C J ET AL	1960	CARDE	HVIS-4-3	AD-244477
451	MOORE H J ET AL	1963	GEOL SURVEY	HVIS-6-2-2	AD-423064
1144	OLSHAKER A E BJORK R L	1961	RAND	HVIS-5-1-1 N62-16559	
82	PALMER E P ET AL	1960	U UTAH	HVIS-4-1	AD-244475
1091	REISMANN H ET AL	1964	MARTIN-DENV	CR-64-5	
1167	SORENSEN N R	1965	UTAH RDC	HVIS-7-6	AD-463232
30	SUMMERS J L	1959	NASA-AMES	TN-D-0094	
27	SUMMERS J L CHARTERS A	1958	NASA-AMES	HVIS-3-1	AD-233487

B.3.3 SCALING CONSIDERATIONS

1216	ANDRIANKIN E I STEPANOV	1963	USSR PLANT SPACE SCI	11-11 1365-1373	
1219	BELYAKOV L V ET AL	1964	USSR SOVIET PHYS-TECH PHYS	8-8 736-739	
1220	BELYAKOV L V ET AL	1964	USSR SOVIET PHYS-TECH PHYS	9-3 403-406	
580	BJORK R L	1963	RAND	RM-3529-PR N63-19789	
1138	BJORK R L OLSHAKER A E	1965A	RAND	RM-2926-PR	AD-617339
1100	GAULT D E MOORE H J	1965	NASA-AMES	HVIS-7-6	AD-463232
1234	NAUMANN R J	1965	NASA-MARSHALL	HVIS-7-4	AD-463230
1057	RINEY T D HEYDA J F	1964	GE-PHILA	ATL-TR-64-64	AD-446745

1058	RINEY T D	HEYDA J F	1965	GE-PHILA	HVIS-7-2	AD-463228
1229	SADOVSKIY M A	ET AL	1966	USSR SOVIET PHYS-DOKLADY	11-4 293-298	
1232	VITMAN F F	ZLATIN N A	1964	USSR SOVIET PHYS-TECH PHYS	8-8 730-735	
1040	WALSH J M	JOHNSON W E	1965	GEN ATOMIC	HVIS-7-2	AD-463228
1041	WALSH J M	ET AL	1966	GEN ATOMIC		

B.3.4 THEORETICAL STUDIES MADE WITH DETAILED HYDRODYNAMIC CODES

1087	AMSDEN A A		1966	LASL	LA-3466	N67-10529
582	BJORK R L		1958	RAND	S-103	AD-305657
128	BJORK R L		1958	RAND	P-1662	AD-224147
152	BJORK R L		1961	RAND	J GEOPHY RES 66-10 3379-3387	
1139	BJORK R L	OLSHAKER A E	1965B	RAND	RM-3490-PR	AD-617549
1147	BJORK R L	RUSENBLATT M	1965	SHOCK HYDRO	HVIS-7-4	AD-463230
1141	BRODE H L	BJORK R L	1961	RAND	UCRL-6438	
1016	EICHELBERGER R J		1963	BRL	HVIS-6-2-2	AD-423064
1148	KREYENHAGEN K N	ET AL	1965	SHOCK HYDRO	HVIS-7-3	AD-463229
1144	OLSHAKER A E	BJORK R L	1961	RAND	HVIS-5-1-1 N62-16559	
1055	RINEY T D		1964	GE-PHILA	ATL-TDR-64-8	
1057	RINEY T D	HEYDA J F	1964	GE-PHILA	ATL-TR-64-64	AD-446745
1056	RINEY T D	HEYDA J F	1965	GE-PHILA	HVIS-7-2	AD-463228
1149	WAGNER M H	ET AL	1965	SHOCK HYDRO	HVIS-7-3	AD-463229
1040	WALSH J M	JOHNSON W E	1965	GEN ATOMIC	HVIS-7-2	AD-463228
365	WALSH J M	TILLOTSON J H	1963	GEN ATOMIC	GA-3827 N63-14302	
1041	WALSH J M	ET AL	1966	GEN ATOMIC		

B.3.4.1 MODIFICATIONS OF HYDRODYNAMIC THEORY TO INCLUDE MATERIAL STRENGTH

1037	DIENES J K	ET AL	1965	GEN ATOMIC	GA-6509	AD-617540
1094	HERMANN W	ET AL	1963	AFSWC(MIT)	TDR-63-12	AD-410386
381	RINEY T D		1963	GE-PHILA	HVIS-6-2-1	AD-423063
1054	RINEY T D		1963	GE-PHILA		A66-31996
1055	RINEY T D		1964	GE-PHILA	ATL-TDR-64-8	
1056	RINEY T D		1965	GE-PHILA	AIAA J 3-1 52-60	
372	RINEY T D	CHERNOFF P R	1961	GE-PHILA	HVIS-5-1-1 N62-16556	
1057	RINEY T D	HEYDA J F	1964	GE-PHILA	ATL-TR-64-64	AD-446745

B.3.5 OTHER THEORETICAL STUDIES

1216	ANDRIANKIN E I	STEPANOV	1963	USSR PLANT SPACE SCI	11-11 1365-1373	
1218	BAUM F A	ET AL	1959	USSR BOOK		AD-400151
1137	BJORK R L		1962	RAND ARS J 32-9	1471-1472	
1138	BJORK R L	OLSHAKER A E	1965A	RAND RM-2926-PR		AD-617339
1154	BORG S F		1966	STEVENS INST TECH	A67-11444	
1165	COOK M A		1958	U UTAH BOOK		
1135	DAVIOS N	HUANG Y K	1962	PENN STATE U J AEROSP SCI	29-5 550-557	
545	DAVIOS N	ET AL	1961	PENN STATE U HVIS-5-1-1	N62-16555	
1078	DIETRICH A M	ET AL	1965	J HOPKINS U HVIS-7-5		AD-463231
1168	DUNN W P		1966	WVT WVT-6609		AD-637136
1169	DUNN W P		1966	WVT AIAA J 4-3	535-536	
635	FUCHS O P		1963	TEMPLE U AIAA J 1-9	2124-2126	
204	FUGELSO L E		1961	AMF HVIS-5-1-1	N62-16557	
7	GEHRING J W JR		1960	BRL HVIS-4-2		AD-244476
9	GLASS C M	POND R B	1960	HRL HVIS-4-3		AD-244477
1153	GOODIER J N		1965	STANFORD U HVIS-7-3		AD-463229
163	KINSLOW R		1963	ARO AEDC-TDR-63-197		AD-421578
1225	LIVANOV L B		1965	USSR COSMIC RES	3-4 529-530	

481	LUTTRELL J L	1963	NOL	HVIS-6-2-1	AD-423063
1157	MARNELL P ET AL	1965	TECHNIK	HVIS-7-3	AD-463229
578	OLSHAKER A E BJORK R L	1961	RAND	HVIS-5-1-1 N62-16558	
341	RAE W J KIRCHNER H P	1963	CAL	HVIS-6-2-1	AD-423063
1227	RAYZER YU P	1964	USSR METEORITIKA 24	82-86	AD-614018
1155	ROLSTEN R F	1965	TECH OPS	AIAA J 3-11 2149-2151	
1043	ROLSTEN R F HUNT H H	1963	GD/ASTRO	AIAA J 1-8 1893-1895	
1045	ROLSTEN R F HUNT H H	1964	CALIF WEST U J	SPACECRAFT 1-3 351-352	
1230	SAGOMONYAN A YA	1964	USSR SOVIET PHYSICS-DOKLADY	9-6 449-452	
220	SCHIPPER J F	1961	AVCO-WIL	HVIS-5-1-1 N62-16561	
133	STANYUKOVICH FEDYNKII	1947	USSR DOKLADY ACAD SCI SSSR	57-2 AD-124240	
605	STANYUKOVICH K P	1960	USSR ARTIFICIAL EARTH SATELLITES	4 86-117	
1029	WALL J K	1964	DOUGLAS-SM	AIAA J 2-7 1242-1246	
1162	YUAN S W BLOOM A M	1964	U TEXAS	AIAA J 2-9 1667-1669	
1163	YUAN S W BLOOM A M	1965	U TEXAS	AIAA J 3-7 1373-1374	
1164	YUAN S W COURTER R W	1965	U TEXAS	HVIS-7-3	AD-463229
119	ZAID M	1960	TECHNIK	HVIS-4-3	AD-244477
600	ZAID M	1961	TECHNIK	HVIS-5-1-1 N62-16560	
1077	ZAKER T A	1965	IITRI	AIAA J 3-7 1372-1373	

B.3.6 PEAK PRESSURE STUDIES

1060	CHAREST J A	1964	GM-SB	TR-64-58 N66-37523	
1018	FRASIER J T ET AL	1965	BRL	HVIS-7-5	AD-463231
1067	GEHRING J W ET AL	1965	GM-SB	HVIS-7-5	AD-463231
1004	GERARD G KYLE P E	1965	ARA	ARA-65-3	
1050	HEYDA J F RINEY T D	1964	GE-PHILA	R64SD87	AD-452991
1051	HEYDA J F RINEY T D	1965	GE-PHILA	ATL-TR-65-26 N65-23644	AD-461267
1052	HEYDA J F RINEY T D	1966	GE-PHILA	CR-609	
1005	KYLE P E GERARD G	1965	ARA	HVIS-7-5	AD-463231
1073	MEYERS C L ET AL	1964	GM-SB	TR-64-48 N65-33856	
1057	RINEY T D HEYDA J F	1964	GE-PHILA	ATL-TR-64-64	AD-446745
1058	RINEY T D HEYDA J F	1965	GE-PHILA	HVIS-7-2	AD-463228

B.3.7 IMPACT OF THIN RODS AND JETS

1012	ALLISON F E	1965	BRL	HVIS-7-5	AD-463231
16	ALLISON F E BRYAN G M	1957	CARNEGIE	HVIS-2-1	AD-201902
1147	BJORK R L ROSENBLATT M	1965	SHOCK HYDRO	HVIS-7-4	AD-463230
1062	CHRISTMAN D R GEHRING J	1965	GM-SB	TR-65-04	
1063	CHRISTMAN D R GEHRING J	1965	GM-SB	TR-65-50	
1064	CHRISTMAN D R GEHRING J	1966	GM-SB	J APPL PHYS 37-4 1579-1587	
1065	CHRISTMAN D R ET AL	1965	GM-SB	HVIS-7-6	AD-463232
6	FELDMAN J B JR	1960	BRL	HVIS-4-2	AD-244476
1067	GEHRING J W ET AL	1965	GM-SB	HVIS-7-5	AD-463231
205	JAMES H J BUCHANAN J S	1958	BRIT JSM	HVIS-3-1	AD-233487
81	KEYES R T ET AL	1960	U UTAH	HVIS-4-3	AD-244477
1101	NYSMITH C R DENARDO B P	1966	NASA-AMES	TN-D-3304	
449	NYSMITH C R ET AL	1964	NASA-AMES	TN-D-1981	
31	SUMMERS J L NIEHAUS W R	1959	NASA-AMES	TN-D-0137	
23	SLATTERY R E CLAY W G	1960	MIT-LL	HVIS-4-3	AD-244477
27	SUMMERS J L CHARTERS A	1958	NASA-AMES	HVIS-3-1	AD-233487

B.3.8 OBLIQUE IMPACT PHENOMENA

60 ANDERSON G D ET AL	1958	SRI-PL	HVIS-3-1	AD-2334877
136 BRYAN G M	1960	CARNEGIE	HVIS-4-3	AD-244477
1026 BRYAN G M	1961	CARNEGIE	HVIS-5-1-2 N62-16572	
1236 BRYAN G M PUGH E M	1962	CARNEGIE J APPL PHYS	33-2 734-738	
1204 CABLE A J	1966	RARDE ENGLAND		
17 CULP F L	1958	CARNEGIE	HVIS-3-1	AD-233487
7 GEHRING J W JR	1960	BRL	HVIS-4-2	AD-244476
437 HERRMANN W JONES A H	1961	MIT	HVIS-5-1-2 N62-16568	
5 KINEKE J H JR	1960	BRL	HVIS-4-1	AD-244475
1148 KREYENHAGEN K N ET AL	1965	SHOCK HYDRO	HVIS-7-3	AD-463229
19 MAURLW W C RINEHART J S	1960	COL SCH VINES	HVIS-4-3	AD-244477
207 SMITH F ET AL	1961	ARDE	HVIS-5-1-2 N62-16570	
30 SUMMERS J L	1959	NASA-AMLS	TN-D-0094	
27 SUMMERS J L CHARTERS A	1958	NASA-AMES	HVIS-3-1	AD-233487

B.4 HYPERVELOCITY IMPACT INTO SINGLE FINITE PLATES

B.4.1 THRESHOLD PENETRATION STUDIES

1216 ANDRIANKIN E I STEPANOV	1963	USSR PLANT SPACE SCI	11-11 1365-1373	
1090 BOUMA D D BURKITT W C	1966	MARTIN-DENV	CR-664	
1049 BRUCE E P	1965	GE-PHILA	HVIS-7-6	AD-463232
1109 CLOUGH N ET AL	1966	NASA-LEWIS	TN-D-3468	
1099 FISH R H SUMMERS J L	1965	NASA-AMES	HVIS-7-6 N65-29392	AD-463232
34 KINARD W H ET AL	1958	NASA-LAN MEMO-10-18-58L		
404 MAIDEN C J	1963	GM-SB	TR-63-203 N63-16482	AD-406169
171 MORTENSEN R B ET AL	1963	AEROJ	HVIS-6-3	AD-423802
75 PARTRIDGE W S ET AL	1958	UTAH RDC	HVIS-3-1	AD-233487
1129 POSEVER F C SCULLY C N	1964	FDL(NAA-DOWNEY)	TPD-64-96	AD-602512
1107 THOMSON R G KRUSZEWSKI	1965	NASA-LANGLEY	HVIS-7-5	AD-463231

B.4.2 EXPERIMENTAL STUDIES OF IMPACT PHENOMENA

144 ALLEN W A ET AL	1958	NOTS	HVIS-3-1	AD-233487
1090 BOUMA D D BURKITT W C	1966	MARTIN-DENV	CR-664	
1109 CLOUGH N ET AL	1966	NASA-LEWIS	TN-D-3468	
1105 DI BATTISTA J D	1966	NASA-LANGLEY	TN-D-3618	
1110 DIEDRICH J H STEPKA F S	1965	NASA-LEWIS	TN-D-2720	
1111 DIEDRICH J H ET AL	1965	NASA-LEWIS	TN-D-3018 N65-33838	
1112 DIEDRICH J H ET AL	1965	NASA-LEWIS	HVIS-7-6	AD-463232
1099 FISH R H SUMMERS J L	1965	NASA-AMES	HVIS-7-6 N65-29392	AD-463232
514 HALPERSON S M	1963	NRL	HVIS-6-2-2	AD-423064
1076 HAYES INT CORP	1964	ATL	TDR-64-51	AD-447004
34 KINARD W H ET AL	1958	NASA-LAN MEMO-10-18-58L		
163 KINSLOW R	1963	ARO	AEDC-TDR-63-197	AD-421578
1006 KINSLOW R	1964	ARO	AEDC-TDR-64-049	
1001 KREYENHAGEN K N ZERNOW	1961	AEROJ	HVIS-5-1-2 N62-16578	
1113 LIEBLEIN S ET AL	1964	NASA-LEWIS	TN-D-2472	
407 MAIDEN C J	1963	GM-SB	HVIS-6-3	AD-423802
12 MAIDEN C J ET AL	1960	CARDE	HVIS-4-3	AD-244477
406 MAIDEN C J ET AL	1963	GM-SB	TR-63-201	AD-404837
1070 MAIDEN C J ET AL	1963	GM-SB	TR-63-208 A64-13304	AD-404274
1010 MCMATH R R	1966	AVCO-LOWELL	CR-65375 N66-27310	
1238 McMILLAN A R	1966	GM-SB	TR-66-67	
171 MORTENSEN R B ET AL	1963	AEROJ	HVIS-6-3	AD-423802
75 PARTRIDGE W S ET AL	1958	U UTAH	HVIS-3-1	AD-233487

1126	PIACESI R ET AL	1966	NOL	TR-66-42	AD-641874
1129	POSEVER F C SCULLY C N	1964	FDL(NAA-DOWNEY)	TRD-64-96	AD-602512
1047	ROLSTEN R F ET AL	1964	CALIF WEST U J	APPL PHYS 35-3-1 556-559	
597	SCHERRER V E	1962	ASD(TECH OPS)	TDR-62-762	AD-286915
1019	VITALI R ET AL	1961	BRL	HVIS-5-1-2 N62-16577	
323	WATSON R W	1961	CARNEGIE	HVIS-5-1-2 N62-16576	
574	WATSON R W ET AL	1963	BUR MINES	HVIS-6-3	AD-423802

B.4.3 THEORETICAL STUDIES MADE WITH DETAILED HYDRODYNAMIC CODES

580	BJORK R L	1963	RAND	RM-3529-PR N63-19789	
1238	MCMILLAN A R	1966	GM-SB	TR-66-67	
1055	RINEY T D	1964	GE-PHILA	ATL-TDR-64-8	
1057	RINEY T D HEYDA J F	1964	GE-PHILA	ATL-TR-64-64	AD-446745
1058	RINEY T D HEYDA J F	1965	GE-PHILA	HVIS-7-2	AD-463228
1240	RINEY T D HALDA E J	1967	GE-PHILA	A67-23716	
1059	RINEY T D ET AL	1966	GE-PHILA	AFATL-TR-66-71	AD-488138
1040	WALSH J M JOHNSON W E	1965	GEN ATOMIC	HVIS-7-2	AD-463228

B.4.4 OTHER THEORETICAL STUDIES

144	ALLEN W A ET AL	1958	NOL	HVIS-3-1	AD-233487
1215	ANDRIANKIN E I	1966	USSR COSMIC RESEARCH	4-2	AD-640326
350	CHOU P C	1961	DREXEL	HVIS-5-1-1 N62-16563	
1136	DAVIUS N ET AL	1965	PENN STATE U	HVIS-7-3	AD-463229
1105	DI BATTISTA J D	1966	NASA-LANGLEY	TN-D-3618	
1099	FISH R H SUMMERS J L	1965	NASA-AMES	HVIS-7-6 N65-29392	AD-463232
163	KINSLOW R	1963	ARO	AEDC-TDR-63-197	AD-421578
604	KRAUS H	1963	UA-PW-CN	HVIS-6-3	AD-423802
406	MAIDEN C J ET AL	1963	GM-SB	TR-63-201	AD-404837
1070	MAIDEN C J ET AL	1963	GM-SB	TR-63-208 A64-13304	AD-404274
1226	MUKHAMEZZHANOV A K	1966	USSR COSMIC RESEARCH	4-2	AD-640326
1106	THOMSON R G	1965	NASA-LANGLEY	TR-R-221	
1107	THOMSON R G KRUSZEWSKI	1965	NASA-LANGLEY	HVIS-7-5	AD-463231
323	WATSON R W	1961	CARNEGIE	HVIS-5-1-2 N62-16576	

B.4.5 IMPACT OF THIN RODS

1147	BJORK R L ROSENBLATT M	1965	SHOCK HYDRO	HVIS-7-4	AD-463230
1063	CHRISTMAN D R GEHRING J	1965	GM-SB	TR-65-50	
1022	HAN L S HESS R E	1965	BATTELLE	HVIS-7-4	AD-463230
171	MORTENSEN R B ET AL	1963	AEROJ	HVIS-6-3	AD-423802

B.4.6 SPALLATION PHENOMENA

1146	BUTCHER B M ET AL	1964	SANDIA	AIAA J 2-6 977-990	
1109	CLOUGH N ET AL	1966	NASA-LEWIS	TN-D-3468	
1110	DIEDRICH J H STEPKA F S	1965	NASA-LEWIS	TN-D-2720	
1112	DIEDRICH J H ET AL	1965	NASA-LEWIS	HVIS-7-6	AD-463232
1099	FISH R H SUMMERS J L	1965	NASA-AMES	HVIS-7-6 N65-29392	AD-463232
450	GAULT D E HEITOWIT E D	1963	NASA-AMES	HVIS-6-2-2	AD-423064
1093	HERRMANN W ET AL	1962	ASD(MIT)	TDR-62-399	AD-288885
163	KINSLOW R	1963	ARO	AEDC-TDR-63-197	AD-421578
1006	KINSLOW R	1964	ARO	AEDC-TDR-64-049	

1113	LIEBLEIN S	ET AL	1964	NASA-LEWIS	TN-D-2472	
12	MAIDEN C J	ET AL	1960	CARDE	HVIS-4-3	AD-244477
1071	MAIDEN C J	ET AL	1965	GM-SB	HVIS-7-4	AD-463230
1010	MCMATH R R		1966	AVCO-LOWELL	CR-65375 N66-27310	
1126	PIACESI R	ET AL	1966	NOL	TR-66-42	AD-641874
1027	RAE W J		1965	CORNELL AER L	HVIS-7-4	AD-463230
1145	RIEDER Z		1959	AFSWC (REPUBLIC)	TM-60-3	AD-606342
1019	VITALI R	ET AL	1961	ERL	HVIS-5-1-2 N62-16577	

B.4.7 SPRAY PHENOMENA

1105	DI BATTISTA J D		1966	NASA-LANGLEY	TN-D-3618	
1001	KREYENHAGEN K N	ZERNOW	1961	AEROJ	HVIS-5-1-2 N62-16578	
020	LEE T	ET AL	1961	UTAH RDC	HVIS-5-1-2 N62-16574	
407	MAIDEN C J		1963	GM-SB	HVIS-6-3	AD-423802
1071	MAIDEN C J	ET AL	1965	GM-SB	HVIS-7-4	AD-463230
171	MORTENSEN R B	ET AL	1963	AEROJ	HVIS-6-3	AD-423802
1166	PALMER E P	TURNER G H	1965	UTAH RDC	HVIS-7-5	AD-463231
574	WATSON R W	ET AL	1963	BUR MINES	HVIS-6-3	AD-423802

B.4.8 OBLIQUE IMPACT PHENOMENA

1049	BRUCE E P		1965	GE-PHILA	HVIS-7-6	AD-463232
514	HALPERSON S M		1963	NRL	HVIS-6-2-2	AD-423064
1001	KREYENHAGEN K N	ZERNOW	1961	AEROJ	HVIS-5-1-2 N62-16578	
1113	LIEBLEIN S	ET AL	1964	NASA-LEWIS	TN-D-2472	
171	MORTENSEN R B	ET AL	1963	AEROJ	HVIS-6-3	AD-423802
207	SMITH F	ET AL	1961	ARDE	HVIS-5-1-2 N62-16570	
323	WATSON R W		1961	CARNEGIE	HVIS-5-1-2 N62-16576	
574	WATSON R W	ET AL	1963	BUR MINES	HVIS-6-3	AD-423802

B.5 HYPERVELOCITY IMPACT ON A THICK PLATE SHIELDED BY A THIN BUMPER

1090	BOUMA D D	BURKITT W C	1966	MARTIN-DENV	CR-664	
39	FUNKHOUSER J O		1961	NASA-LANGLEY	TN-D-0802	
465	HUMES D H		1963	NASA-LANGLEY	TN-D-1784	
461	HUMES D	ET AL	1961	NASA-LANGLEY	HVIS-5-1-2 N62-16575	
404	MAIDEN C J		1963	GM-SB	TR-63-203 N63-16482	AD-406169
407	MAIDEN C J		1963	GM-SB	HVIS-6-3	AD-423802
1241	MAIDEN C J	MCMILLAN A R	1964	GM-SB	AIAA J 2-11 1992-1998	
1070	MAIDEN C J	ET AL	1963	GM-SB	TR-63-208 A64-13304	AD-404274
1238	MCMILLAN A R		1966	GM-SB	TR-66-67	
24	OLSHAKER A E		1960	MIT	J APPL PHYS 31-12 2118-2120	
1057	RINEY T D	HEYDA J F	1964	GE-PHILA	ATL-TR-64-64	AD-446745
433	SANDORFF P E		1963	LOCKHEED MSC	HVIS-6-3	AD-423802

B.6 HYPERVELOCITY IMPACT INTO MULTI-SHEET OR COMPLEX TARGETS

1110	DIEDRICH J H	STEPKA F S	1965	NASA-LEWIS	TN-D-2720	
4	FELDMAN J B JR		1958	BRL	HVIS-3-1	AD-233487
1076	HAYES INT CORP		1964	ATL	TDR-64-51	AD-447004
1006	KINSLOW R		1964	ARO	AEDC-TDR-64-049	
1001	KREYENHAGEN K N	ZERNOW	1961	AEROJ	HVIS-5-1-2 N62-16578	
1023	LUNDBERG J F	ET AL	1966	BOEING-SEA	J SPACECRAFT 3-2 182-187	

1241 MAIDEN C J	MCMILLAN A R	1964	GM-SB	AIAA J 2-11	1992-1998
1071 MAIDEN C J	ET AL	1965	GM-SB	HVIS-7-4	AD-463230
1010 MCMATH R R		1966	AVCO-LOWELL	CR-65375 N66-27310	
408 MCMILLAN A R		1963	GM-SB	HVIS-6-3	AD-423802
1238 MCMILLAN A R		1966	GM-SB	TR-66-67	
171 MORTENSEN R B	ET AL	1963	AEROJ	HVIS-6-3	AD-423802
33 NYSMITH C R	SUMMERS J L	1961	NASA-AMES	TN-D-1039	
447 NYSMITH C R	SUMMERS J L	1962	NASA-AMES	TN-D-1431 N62-16839	
1129 POSEVER F C	SCULLY C N	1964	FDL(NAA-DOWNEY)	TRD-64-96	AD-602512
411 REYNOLDS B W	ENMONS R H	1963	GOODYR	HVIS-6-3	AD-423802
1048 ROLSTEN R F	ET AL	1964	CALIF WEST U	J APPL PHYS 35-5 1655-1656	
1057 RINEY T D	HEYDA J F	1964	GE-PHILA	ATL-TR-64-64	AD-446745
1058 RINEY T D	HEYDA J F	1965	GE-PHILA	HVIS-7-2	AD-463228
1240 RINEY T D	HALDA E J	1967	GE-PHILA	A67-23716	
1059 RINEY T D	ET AL	1966	GE-PHILA	AFATL-TR-66-71	AD-488138
1104 SUMMERS J L		1966	NASA-AMES		

B.6.1 IMPACT ON LIQUID-FILLED CONTAINERS

1026 FERGUSON C W		1966	DOUGLAS	SM-52027 N66-22267
1114 MORSE C R	STEPKA F S	1966	NASA-LEWIS	TN-D-3627
1115 STEPKA F S		1966	NASA-LEWIS	TN-D-3456
1116 STEPKA F S	MORSE C R	1963	NASA-LEWIS	TN-D-1537
1118 STEPKA F S	ET AL	1965	NASA-LEWIS	HVIS-7-6

AD-463232

B.6.1.1 PEAK PRESSURES IN LIQUIDS

1032 CHOU P C	ET AL	1963	DREXEL INST	DIT-R-160-1 CR 50249
1026 FERGUSON C W		1966	DOUGLAS	SM-52027 N66-22267
382 HEYDA J F		1963	GE-PHILA	HVIS-6-2-1
1117 STEPKA F S	ET AL	1965	NASA-LEWIS	TN-D-3143

AD-423063

B.6.2 IMPACT ON COMBUSTIBLE MATERIALS

1237 CARTER D J JR		1960	NASA-LANGLEY	TN-D-442
1044 ROLSTEN R F	HUNT H H	1963	CALIF WEST U	ASTRO AEROSP ENGR 1-10 20-24
1118 STEPKA F S	ET AL	1965	NASA-LEWIS	HVIS-7-6 AD-463232

B.6.3 IMPACT ON TUBULAR TARGETS

1111 DIEDRICH J H	ET AL	1965	NASA-LEWIS	TN-D-3018 N65-33838
1112 DIEDRICH J H	ET AL	1965	NASA-LEWIS	HVIS-7-6
1113 LIEBLEIN S	ET AL	1964	NASA-LEWIS	TN-D-2472
408 MCMILLAN A R		1963	GM-SB	HVIS-6-3
1072 MCMILLAN A R	ET AL	1966	NASA-LEWIS	TN-D-3512

AD-463232

AD-423802

B.7 IMPACT OF LIQUID DROPS ON LIQUID SURFACES

1121 ENGEL O G		1962	WADD(NBS)	TR-60-475-2	AD-408984
1122 ENGEL O G		1966	WADD(NBS)	TR-60-475-2-1	AD-641302
1161 PITEK M T	HAMMITT F G	1966	U MICHIGAN	08153-1-T	AD-803278

B.8 FUNDAMENTAL RESEARCH IN SOLID MECHANICS (STRESS WAVES, ONE DIMENSIONAL PHENOMENA, ...)

B.8.1 BOOKS

1134 DAVIUS N (ED)	1960		
1174 FERRY J D	1961		
1079 FITZGERALD E R	1966	JOHN HOPKINS U	
1200 KOLSKY H	1953	IMP CHEM IND'S OXFORD U PRESS LONDON	
93 KINEHART J S PEARSON J	1954	NOTS	
1210 SNEDDON I N HILL R (ED)	1960		

B.8.2 ARTICLES

1012 ALLISON F E	1965	BRL HVIS-7-5	AD-463231
1214 ANDRIANKIN E I	1965	USSR J APPL MECH TECH PHY 1 88-92	AD-633118
1202 BACH G C LEE J H	1967	MCGILL U AIAA-P-67-141 A67-18290	
1030 CHOU P C ALLISON F E	1966	DREXEL INST J APPL PHYS 37-2 853-860	
1031 CHOU P C BURNS B P	1967	DREXEL INST J APPL PHYS 38-2 553-560	
1033 CHOU P C ET AL	1965	DREXEL INST HVIS-7-2	AD-463228
1136 DAVIUS N ET AL	1965	PENN STATE U HVIS-7-3	AD-463229
1036 DIENES J K	1965	GEN ATOMIC HVIS-7-2(GA 5755)	AD-463228
1133 DITARANTO R A	1966	PENN MIL COL MEL-RD-R-37-66	AD-629785
628 FYFE I M	1961	BOEING-SEA HVIS-5-1-1 N62-16562	
1008 KINSLOW R	1967	ARO AIAA-P-67-140	
1024 KOLSKY H	1966	BROWN U A66-42268	
1025 LIFSHITZ I M KOLSKY H	1965	BROWN U J MECH PHYS SOLIDS 13-6 361-376	
1080 MOBLEY C E POND R B	1965	J HOPKINS U HVIS-7-5	AD-463231
1166 PALMER E P TURNER G H	1965	UTAH RDC HVIS-7-5	AD-463231
1175 SHEWMON P G ZACKAY V F	1961	INTERSCIENCE PUBLISHERS N Y	
1038 TEICHMANN T	1965	GEN ATOMIC GAMD-6501	AD-620193
1231 VITMAN F F STEPANOV V A	1959	USSR FTD-MT-64-217	AD-605234
430 WILKINS M L GIROUX R	1963	UCRL UCRL-7271	

B.9 EQUATIONS OF STATE (INCLUDING ONE-DIMENSIONAL SHOCK PHENOMENA)

1081 ANON	1964	ATD-L1B CONGR AID P-64-44	AD-602358
1082 ANON	1965	ATD-LIB CONGR P-65-1	AD-610054
1211 AL'TSHULER L V	1965	USSR SOV PHYS USPEKHI 8-1 52-91	
1212 AL'TSHULER L V ET AL	1959	USSR SOV PHYS DOKLADY 3 761-763	
1213 AL'TSHULER L V ET AL	1960	USSR SOV PHYS JETP 11-4 766-775	
1217 BAKANOVA A A ET AL	1965	USSR SOV PHYS SOLID STATE 7-6 1307-1313	
1150 DORAN D G LINDE R K	1965	SRI POULT LAB TR-004-65	AD-479462
1035 EHRENFIELD J ET AL	1966	GCA J APPL PHYS 37-13 4737-4738	
1222 GOGOLEV V M ET AL	1963	USSR J APPL MECH TECH PHY 5	AD-614773
1223 KURMER S B ET AL	1962	USSR SOV PHYS JETP 15-3 477-488	
1224 KRUPNIKOV K K ET AL	1962	USSR SOV PHYS JETP 15-3 470-476	
1083 KSANDER Y	1966	ATD-LIB CONG REP-66-45	AD-635477
1143 MCCLOSKEY D J	1964	RAND RM-3905-PR	AD-429196
148 MCQUEEN R G MARSH S P	1960	LASL J APPL PHYS 31-7 1253-1269	
1151 NAAR J	1964	SRI DASA-1285-1	
1084 PINDY F V	1966	ATD-LIB CONG REP-66-60	AD-647408
1086 STROMER P R	1963	LOCKHEED-MSC SB-63-31	AD-419449
1039 TILLOTSON J H	1962	GEN ATOMIC GA-3216	AD-486711
1002 WAGNER M H ET AL	1962	AFSWC(AEROJ)TDR-62-66-1	AD-286345
1149 WAGNER M H ET AL	1965	SHOCK HYDRO HVIS-7-3	AD-463229

1088 WALSH J M RICE M H	1957	LASL J CHEM PHYS 26-4	815-823	
141 WALSH J M ET AL	1957	LASL PHYS REV	108-2 196-216	
1233 ZEL'DOVICH YA B ET AL	1959	USSR Sov PHYS DOKLADY 3	938-939	

B.10 HYDRODYNAMIC CODE METHODS

1087 AMSDEN A A	1966	LASL	LA-3466	N67-10529
1140 BJORK R L ET AL	1963	RAND	RM-2628-PR	AD-425951
1037 DIENES J K ET AL	1965	GEN ATOMIC	GA-6509	AD-617540
1142 KAPLAN M A PAPETTI R A	1966	RAND	RM-4876-PR	AD-641655

B.11 IMPACT FLASH AND IONIZATION

588 FRIICHTENICHT J SLATTERY	1963	TRW-STL	HVIS-6-2-2	AD-423064
83 GROW R W ET AL	1960	U UTAH	HVIS-4-3	AD-244477
1066 GEHRING J W WARNICA R L	1963	GM-SB	HVIS-6-2-2	AD-423064
1067 GEHRING J W ET AL	1965	GM-SB	HVIS-7-5	AD-463231
1242 JEAN B	1966		AIAA J 4-10 1854-1856	
1247 LEE T W	1964	ATL(UTAH RDC)	TDR-64-24	AD-445704
448 MACCORMACK R W	1963	NASA-AMES	HVIS-6-2-2	AD-423064
1131 ROSEN F D SCULLY C N	1965	NAA-DOWNEY	HVIS-7-6	AD-463232

B.12 EXPLOSIVE AND NUCLEAR CRATERING PHENOMENA

115 ALLISON F E	1958	CARNEGIE	HVIS-3-1	AD-233487
18 ALLISON F E ET AL	1960	CARNEGIE	HVIS-4-1	AD-244475
1218 BAUM F A ET AL	1959	USSR		AD-400151
1165 COOK M A	1958	U UTAH	BOOK	
547 DAVIDS N ET AL	1963	PENN STATE U	HVIS-6-2-1	AD-423063
1013 EICHELBERGER R J	1958	BRL	HVIS-3-1	AD-233487
9 GLASS C M POND R B	1960	BRL	HVIS-4-3	AD-244477
210 HOENIG S A RITTER A	1957	ARMOUR	HVIS-2-1	AD-201902
1006 KINSLOW R	1964	ARO	AEDC-TDR-64-049	
1152 SAUER F M ET AL	1964	SRI	DASA-1285-4	

B.13 METALLURGICAL AND MICROSCOPIC CONSIDERATIONS IN HYPERVELOCITY IMPACT

89 ABBOT K H	1960	WATERTOWN AR	HVIS-4-2	AD-244476
18 ALLISON F E ET AL	1960	CARNEGIE	HVIS-4-1	AD-244475
1078 DIETRICH A M ET AL	1965	J HOPKINS U	HVIS-7-5	AD-463231
6 FELDMAN J B JR	1960	BRL	HVIS-4-2	AD-244476
1099 FISH R H SUMMERS J L	1965	NASA-AMES	HVIS-7-6	N65-29392 AD-463232
9 GLASS C M POND R B	1960	BRL	HVIS-4-3	AD-244477
8 GEHRING J W RICHARDS L	1960	BRL	HVIS-4-3	AD-244477
1067 GEHRING J W ET AL	1965	GM-SB	HVIS-7-5	AD-463231
1069 GEHRING J W ET AL	1965	GM-SB	ASM-TR-W-13-5-65	
1004 GERARD G KYLE P E	1965	ARA	ARA-65-3	
1076 HAYES INT CORP	1964	ATL	TDR-64-51	AD-447004
1005 KYLE P E GERARD G	1965	ARA	HVIS-7-5	AD-463231
421 POND R B ET AL	1963	JOHN HOPKINS	HVIS-6-2-2	AD-423064
12 MAIDEN C J ET AL	1960	CARDE	HVIS-4-3	AD-244477
1080 MOBLEY C E POND R B	1965	J HOPKINS U	HVIS-7-5	AD-463231
1166 PALMER E P TURNER G H	1965	UTAH RDC	HVIS-7-5	AD-463231

1124 PIACESI R ET AL	1964	NOL	AIAA J 2-11 2040-2042	
1125 PIACESI R ET AL	1965	NOL	HVIS-7-5	AD-463231
1103 SCHMIDT R A ET AL	1955	NASA=AMES	HVIS-7-5	AD-463231
1175 SHEWMON P G ZACKAY V F	1961		INTERSCIENCE PUBLISHERS N Y	
1158 SLATTERY J C	1966	TRW	03246-6001-R000 N67-16639	
1089 ZUKAS E G	1966	LASL	METALS ENGR QUAR 6-2 1-20	

B.13.1 MATERIAL HARDNESS STUDIES

1216 ANDRIANKIN E I STEPANOV	1963	USSR PLANT SPACE SCI 11-11	1365-1373	
1243 BATSON R G HYDE J H	1931			
1244 LESSELLS J M	1954			
1245 LYSAGHT V E	1949			
1203 MOTT B W	1956			
1209 O'NEILL H	1934	VICTORIA U		
1175 SHEWMON P G ZACKAY V F	1961		INTERSCIENCE PUBLISHERS N Y	
1176 WESTROOK J H	1953	GE-SCH	TRANS ASM 45 221-248	
1089 ZUKAS E G	1966	LASL	METALS ENGR QUAR 6-2 1-20	

B.14 THERMAL CONSIDERATIONS IN HYPERVELOCITY IMPACT

60 ANDERSON G D ET AL	1958	SRI-PL	HVIS-3-1	AD-2334877
1221 BELYAKOV L V ET AL	1965	USSR SOVIET PHYSICS-DOKLADY	10-1 69-71	
580 BJORK R L	1963	RAND	RM-3529-PR N63-19789	
1139 BJORK R L OLSHAKER A E	1965B	RAND	RM-3490-PR	AD-617549
1112 DIEDRICH J H ET AL	1965	NASA-LEWIS	HVIS-7-6	AD-463232
1067 GEHRING J W ET AL	1965	GM-SB	HVIS-7-5	AD-463231
1069 GEHRING J W ET AL	1965	GM-SB	ASM-TR-W-13-5-65	
1113 LIEBLEIN S ET AL	1964	NASA-LEWIS	TN-D-2472	
1010 MCMATH R R	1966	AVCO-LOWELL	CR-65375 N66-27310	
408 McMILLAN A R	1963	GM-SB	HVIS-6-3	AD-423802
1144 OLSHAKER A E BJORK R L	1961	RAND	HVIS-5-1-1 N62-16559	
1166 PALMER E P TURNER G H	1965	UTAH RDC	HVIS-7-5	AD-463231
1124 PIACESI R ET AL	1964	NOL	AIAA J 2-11 2040-2042	
1125 PIACESI R ET AL	1965	NOL	HVIS-7-5	AD-463231
219 ROCKOWITZ M ET AL	1961	AVCO-WIL	HVIS-5-1-2 N62-16573	
1156 ROLSTEN R F ET AL	1966		NATURE 212-5061 495-497	
1108 TIPPENS P E DAVIDSON J	1966	NASA-LANGLEY	TN-D-3631	
1176 WESTBROOK J H	1953	GE-SCH	TRANS ASM 45 221-248	
1089 ZUKAS E G	1966	LASL	METALS ENGR QUAR 6-2 1-20	

B.15 METEOROID ENVIRONMENT AND DESIGN CONSIDERATIONS

1042 ALI A	1963	GD/ASTRO	ERR-AN-167	
576 BJORK R L GAZLEY C JR	1959	RAND	RM-2332	
1172 COSBY W A LYLE R G	1965	NAS-NRC	SP-78	
540 D'ANNA P J	1963	NORTHROP-HAW	HVIS-6-3 N63-15390	AD-423802
1132 D'ANNA P J HEITZ R M	1966	NORTHROP-HAW	CR-485	
1119 DALTON C C	1964	NASA-MARSHALL	TN-D-1996	
1120 DALTON C C	1966	NASA-MARSHALL	TMX-53512 N66-38943	
463 DAVIDSON J R ET AL	1963	NASA-LANGLEY	TN-D-1493	
1068 GEHRING J W ET AL	1965	GM-SB	J SPACECRAFT 2-5 731-737	
1069 GEHRING J W ET AL	1965	GM-SB	ASM-TR-W-13-5-65	
210 HOENIG S A RITTER A	1957	ARMOUR	HVIS-2-1	AD-201902
1034 KLAHR C N	1965	FUND METH ASS	HVIS-7-6	AD-463232

21 KORNHAUSER M	1958	GE-PHILA	HVIS-3-1	AD-233487
1053 KORNHAUSER M	1964		SPARTAN BKS INC	BALTIMORE MD
1239 KRUSZEWSKI E T HAYDUK R	1967	NASA-LANGLEY	A67-23700	
1023 LUNDBERG J F ET AL	1966	BOEING-SEA J	SPACECRAFT 3-2	182-187
404 MAIDEN C J	1963	GM-SB	TR-63-203 N63-16482	AD-406169
407 MAIDEN C J	1963	GM-SB	HVIS-6-3	AD-423802
1130 POSEVER F C ET AL	1965	NAA-DOWNEY J	SPACECRAFT 2-5	738-741
411 REYNOLDS B W EMMONS R H	1963	GOODYR	HVIS-6-3	AD-423802
434 STERBENTZ W H LONG L L	1963	LOCKHEED MSC	HVIS-6-3	AD-423802

B.16 MISCELLANEOUS STUDIES

1170 ANON	1963	ASD	TDR-63-140	AD-408777
1171 ANON	1966	AGARD		
1160 NORDYKE M D (ED)	1961	UCRL	UCRL-6438	

APPENDIX C

ABBREVIATED BIBLIOGRAPHIC LISTINGS

ARRANGED ALPHABETICALLY BY FIRST AUTHOR'S NAME

1170	ANON	1963	ASD	TDR-63-140	AD-408777
1081	ANON	1964	ATD-L1B CONGR AID P-64-44	AD-602358	
1082	ANON	1965	ATD-LIB CONGR P-65-1	AD-610054	
1171	ANON	1966	AGARD		
89	ABBOT K H	1960	WATERFORD AR HVIS-4-2		AD-244476
1211	AL'TSHULER L V	1965	USSR SOV PHYS USPEKHI 8-1 52-91		
1212	AL'TSHULER L V ET AL	1959	USSR SOV PHYS DOKLADY 3 761-763		
1213	AL'TSHULER L V ET AL	1960	USSR SOV PHYS JETP 11-4 766-775		
454	ALEXANDER W M BERG O E	1961	NASA-GODDARD HVIS-5-1-2 N62-16580		
1042	ALI A	1963	GD/ASTRO	ERR-AN-167	
144	ALLEN W A ET AL	1958	NOL	HVIS-3-1	AD-233487
115	ALLISON F E	1958	CARNEGIE	HVIS-3-1	AD-233487
1011	ALLISON F E	1961	BRL	HVIS-5-1-1 N62-16553	
1012	ALLISON F E	1965	BRL	HVIS-7-5	AD-463231
16	ALLISON F E BRYAN G M	1957	CARNEGIE	HVIS-2-1	AD-201902
18	ALLISON F E ET AL	1960	CARNEGIE	HVIS-4-1	AD-244475
1087	AMSDEN A A	1966	LASL	LA-3466 N67-10529	
60	ANDERSON G D ET AL	1958	SRI-PL	HVIS-3-1	AD-233487
1214	ANDRIANKIN E I	1965	USSR J APPL MECH TECH PHY 1 88-92		AD-633118
1215	ANDRIANKIN E I	1966	USSR COSMIC RESEARCH 4-2		AD-640326
1216	ANDRIANKIN E I STEPANOV	1963	USSR PLANT SPACE SCI 11-11 1365-1373		
50	ATKINS W W	1958	NRL	HVIS-3-1	AD-233487
51	ATKINS W W	1960	NRL	HVIS-4-1	AD-244475
1202	BACH G C LEE J H	1967	MCGILL U AIAA-P-67-141 A67-18290		
1217	BAKANOVA A A ET AL	1965	USSR SOV PHYS SOLID STATE 7-6 1307-1313		
1243	BATSON R G HYDE J H	1931			
1218	BAUM F A ET AL	1959	USSR		AD-400151
1246	BELTON W L ET AL	1967	BATTELLE BAT-197A-21-2(REV 2)		AD-809916
1219	BELYAKOV L V ET AL	1964	USSR SOVIET PHYS-TECH PHYS 8-8 736-739		
1220	BELYAKOV L V ET AL	1964	USSR SOVIET PHYS-TECH PHYS 9-3 403-406		
1221	BELYAKOV L V ET AL	1965	USSR SOVIET PHYSICS-DOKLADY 10-1 69-71		
1020	BERT C W ET AL	1963	BATTELLE BAT-197-16-1		AD-408386
582	BJORK R L	1958	RAND	S-103	AD-305657
128	BJORK R L	1958	RAND	P-1662	AD-224147
152	BJORK R L	1961	RAND	J GEOPHY RES 66-10 3379-3387	
1137	BJORK R L	1962	RAND	ARS J 32-9 1471-1472	
580	BJORK R L	1963	RAND	RM-3529-PR N63-19789	
576	BJORK R L GAZLEY C JR	1959	RAND	RM-2332	
1138	BJORK R L OLSAKER A E	1965A	RAND	RM-2926-PR	AD-617339
1139	BJORK R L OLSAKER A E	1965B	RAND	RM-3490-PR	AD-617549
1147	BJORK R L ROSENBLATT M	1965	SHOCK HYDRO	HVIS-7-4	AD-463230
1140	BJORK R L ET AL	1963	RAND	RM-2628-PR	AD-425951
1154	BORG S F	1966	STEVENS INST TECH	A67-11444	
1090	BOUMA D D BURKITT W C	1966	MARTIN-DENV	CR-664	
1141	BRODE H L BJORK R L	1961	RAND	UCRL-6438	
376	BRUCE E P	1961	GE-PHILA	HVIS-5-1-2 N62-16569	AD-600668
1049	BRUCE E P	1965	GE-PHILA	HVIS-7-6	AD-463232
136	BRYAN G M	1960	CARNEGIE	HVIS-4-3	AD-244477
1026	BRYAN G M	1961	CARNEGIE	HVIS-5-1-2 N62-16572	
1236	BRYAN G M PUGH E M	1962	CARNEGIE J APPL PHYS 33-2 734-738		
1146	BUTCHER B M ET AL	1964	SANDIA AIAA J 2-6 977-990		
1204	CABLE A J	1966	RARDE ENGLAND		
1237	CARTER D J JR	1960	NASA-LANGLEY TN-D-442		
1060	CHAREST J A	1964	GM-SB	TR-64-58 N66-37523	
32	CHARTERS A C	1960	NASA-AMES SCI AMER 203-10 128-140		
28	CHARTERS A C LOCKE G S	1958	NACA-AMES RM-A58B26		
29	CHARTERS A C SUMMERS J	1960	NOL(NASA-AMES)NOLR-1238		

1235	CHARTERS A C ET AL	1966	GM-SB		
350	CHOU P C	1961	DREXEL	HVIS-5-1-1	N62-16563
1030	CHOU P C ALLISON F E	1966	DREXEL INST	J APPL PHYS	37-2 853-860
1031	CHOU P C BURNS B P	1967	DREXEL INST	J APPL PHYS	38-2 553-560
1032	CHOU P C ET AL	1963	DREXEL INST	DIT-R-160-1 CR	50249
1033	CHOU P C ET AL	1965	DREXEL INST	HVIS-7-2	AD-463228
1061	CHRISTMAN D R	1966	GM-SB	AIAA J 4-10	1872-1874
1062	CHRISTMAN D R GEHRING J	1965	GM-SB	TR-65-04	
1063	CHRISTMAN D R GEHRING J	1965	GM-SB	TR-65-50	
1064	CHRISTMAN D R GEHRING J	1966	GM-SB	J APPL PHYS	37-4 1579-1587
1065	CHRISTMAN D R ET AL	1965	GM-SB	HVIS-7-6	AD-463232
55	CLARK E N ET AL	1960	PICATINNY AR	HVIS-4-1	AD-244475
1109	CLOUGH N ET AL	1966	NASA-LEWIS	TN-D-3468	
35	COLLINS R D KINARD W H	1960	NASA-LANGLEY	TN-D-0238	
1165	COOK M A	1958	U UTAH	BOOK	
77	COOK M A KEYES R T	1958	U UTAH	HVIS-3-1	AD-233487
1172	CUSBY W A LYLE R G	1965	NAS-NRC	SP-78	
17	CULP F L	1958	CARNEGIE	HVIS-3-1	AD-233487
540	D'ANNA P J	1963	NORTHROP-HAW	HVIS-6-3	N63-15390 AD-423802
1132	D'ANNA P J HEITZ R M	1966	NORTHROP-HAW	CR-485	
1119	DALTON C C	1964	NASA-MARSHALL	TN-D-1996	
1120	DALTON C C	1966	NASA-MARSHALL	TMX-53512 N66-38943	
1134	DAVIDS N (ED)	1960		BOOK	
1135	DAVIDS N HUANG Y K	1962	PENN STATE U	J AEROSP SCI	29-5 550-557
545	DAVIOS N ET AL	1961	PENN STATE U	HVIS-5-1-1	N62-16555
547	DAVIOS N ET AL	1963	PENN STATE U	HVIS-6-2-1	AD-423063
1136	DAVIDS N ET AL	1965	PENN STATE U	HVIS-7-3	AD-463229
463	DAVIDSON J R ET AL	1963	NASA-LANGLEY	TN-D-1493	
1173	DAVIS D M	1963	ASD-WL-EGLIN	HVIS-6-3	AD-423802
445	DENARDO B P	1962	NASA-AMES	TN-D-1210	AD-273315
1097	DENARDO B P	1966	NASA-AMES	TN-D-3369	
1098	DENARDO B P NYSMITH C R	1966	NASA-AMES		
1105	DI BATTISTA J D	1966	NASA-LANGLEY	TN-D-3618	
1110	DIEDRICH J H STEPKA F S	1965	NASA-LEWIS	TN-D-2720	
1111	DIEDRICH J H ET AL	1965	NASA-LEWIS	TN-D-3018 N65-33838	
1112	DIEDRICH J H ET AL	1965	NASA-LEWIS	HVIS-7-6	AD-463232
1036	DIENES J K	1965	GEN ATOMIC	HVIS-7-2(GA 5755)	AD-463228
1037	DIENES J K ET AL	1965	GEN ATOMIC	GA-6509	AD-617540
1078	DIETRICH A M ET AL	1965	J HOPKINS U	HVIS-7-5	AD-463231
1133	DITARANTO R A	1966	PENN MIL COL	MEL-RD-R-37-66	AD-629785
1150	DORAN D G LINDE R K	1965	SRI POULT LAB	TR-004-65	AD-479462
1168	DUNN W P	1966	WVT	WVT-6609	AD-637136
1169	DUNN W P	1966	WVT	AIAA J 4-3 535-536	
1035	EHRENFELD J ET AL	1966	GCA	J APPL PHYS	37-13 4737-4738
1013	EICHELBERGER R J	1958	BRL	HVIS-3-1	AD-233487
1014	EICHELBERGER R J	1961	BRL	HVIS-5-1-2	N62-16564
1015	EICHELBERGER R J	1961	BRL	HVIS-5-1-2	N62-16565
1016	EICHELBERGER R J	1963	BRL	HVIS-6-2-2	AD-423064
1017	EICHELBERGER R GEHRING	1962	BRL	ARS J 32-10 1583-1590	
1121	ENGEL O G	1962	WADD(NBS)	TR-60-475-2	AD-408984
441	ENGEL O G	1963	HVIS-6-2-2		AD-423064
1122	ENGEL O G	1966	WADD(NBS)	TR-60-475-2-1	AD-641302
1123	ENGEL O G	1966	WADD(NBS)	TR-60-475-3	AD-643237
4	FELDMAN J B JR	1958	BRL	HVIS-3-1	AD-233487
6	FELDMAN J B JR	1960	BRL	HVIS-4-2	AD-244476
1028	FERGUSON C W	1966	DOUGLAS	SM-52027 N66-22267	
1174	FERRY J D	1961		BOOK	
1099	FISH R H SUMMERS J L	1965	NASA-AMES	HVIS-7-6 N65-29392	AD-463232

1079	FITZGERALD E R	1966	JOHN HOPKINS U		
264	FRASIER J T KARPOV B G	1961	BROWN U	HVIS-5-1-2 N62-16567	
1018	FRASIER J T ET AL	1965	BRL	HVIS-7-5	AD-463231
56	FRIICHTENICHT HAMMERMESH	1960	TRW	HVIS-4-3	AD-244477
588	FRIICHTENICHT J SLATTERY	1963	TRW-STL	HVIS-6-2-2	AD-423064
635	FUCHS O P	1963	TEMPLE U	AIAA J 1-9 2124-2126	
204	FUGELSO L E	1961	AMF	HVIS-5-1-1 N62-16557	
39	FUNKHOUSER J O	1961	NASA-LANGLEY	TN-D-0802	
628	FYFE I M	1961	BOEING-SEA	HVIS-5-1-1 N62-16562	
450	GAULT D E HEITOWIT E D	1963	NASA-AMES	HVIS-6-2-2	AD-423064
1100	GAULT D E MOORE H J	1965	NASA-AMES	HVIS-7-6	AD-463232
457	GAYLE J B ET AL	1963	NASA-MARSHALL	TMX-56505 N65-25011	
2	GEHRING J W JR	1958	BRL	HVIS-3-1	AD-233487
7	GEHRING J W JR	1960	BRL	HVIS-4-2	AD-244476
8	GEHRING J W RICHARDS L	1960	BRL	HVIS-4-3	AD-244477
1060	GEHRING J W WARNICA R L	1963	GM-SB	HVIS-6-2-2	AD-423064
1067	GEHRING J W ET AL	1965	GM-SB	HVIS-7-5	AD-463231
1068	GEHRING J W ET AL	1965	GM-SB	J SPACECRAFT 2-5 731-737	
1069	GEHRING J W ET AL	1965	GM-SB	ASM-TR-W-13-5-65	
1004	GERARD G KYLE P E	1965	ARA	ARA-65-3	
1021	GIDEON D N ET AL	1965	BATTELLE BAT-197-21-2(REV 1)		AD-463372
9	GLASS C M POND R B	1960	BRL	HVIS-4-3	AD-244477
1222	GOGOLEV V M ET AL	1963	USSR J APPL MECH TECH PHY 5		AD-614773
1159	GOLDSMITH W	1963	U CALIF BERKLEY	APPL MECH REV 16-11 855-866	
1153	GOODIER J N	1965	STANFORD U	HVIS-7-3	AD-463229
164	GOODMAN E H LILES C D	1963	ARO	HVIS-6-2-2	AD-423064
1085	GRAZIANO E MCCORMICK H	1963	LOCKHEED-MSC	SB-63-58	AD-431973
83	GROW R W ET AL	1960	U UTAH	HVIS-4-3	AD-244477
514	HALPERSON S M	1963	NRL	HVIS-6-2-2	AD-423064
1127	HALPERSON S M	1965	NRL	HVIS-7-5	AD-463231
510	HALPERSON S M ATKINS W	1961	NRL	HVIS-5-1-2 N62-16571	
1128	HALPERSON S ET AL	1960	NRL	HVIS-4-3	AD-244477
1022	HAN L S HESS R E	1965	BATTELLE	HVIS-7-4	AD-463230
1076	HAYES INT CORP	1964	ATL	TDR-64-51	AD-447004
1075	HAYES INT CORP	1963	APGC	TDR-63-22	AD-401759
437	HERRMANN W JONES A H	1961	MIT	HVIS-5-1-2 N62-16568	
438	HERRMANN W JONES A H	1961	MIT	ASRL-R-99-1	AD-267289
1092	HERRMANN W JONES A H	1961	MIT	ASRL-R-99-1-A	AD-267290
440	HERRMANN W JONES A H	1963	ASD(MIT)	TDR-63-140	AD-408777
1093	HERRMANN W ET AL	1962	ASD(MIT)	TDR-62-399	AD-288885
1094	HERMANN W ET AL	1963	AFSWC(MIT)	TDR-63-12	AD-410386
382	HEYDA J F	1963	GE-PHILA	HVIS-6-2-1	AD-423063
1050	HEYDA J F RINEY T D	1964	GE-PHILA	R64SD87	AD-452991
1051	HEYDA J F RINEY T D	1965	GE-PHILA	ATL-TR-65-26 N65-23644	AD-461267
1052	HEYDA J F RINEY T D	1966	GE-PHILA	CR-609	
210	HOENIG S A RITTER A	1957	ARMOUR	HVIS-2-1	AD-201902
1205	HOPKINS H G	1961	ARDE	HVIS-5-1-1 N62-16554	
103	HOPKINS H G KOLSKY H	1960	ARDE	HVIS-4-1	AD-244475
465	HUMES D H	1963	NASA-LANGLEY	TN-D-1784	
461	HUMES D ET AL	1961	NASA-LANGLEY	HVIS-5-1-2 N62-16575	
205	JAMES H J BUCHANAN J S	1958	BRIT JSM	HVIS-3-1	AD-233487
1242	JEAN B	1966		AIAA J 4-10 1854-1856	
1095	JONES A H ET AL	1963	MIT	ASRL-R-99-2	AD-432815
1142	KAPLAN M A PAPETTI R A	1966	RAND	RM-4876-PR	AD-641655
81	KEYES R T ET AL	1960	U UTAH	HVIS-4-3	AD-244477
38	KINARD W H COLLINS R D	1961	NASA-LANGLEY	TN-D-0726	
34	KINARD W H ET AL	1958	NASA-LAN	MEMO-10-18-58L	

5	KINEKE J H JR	1960	BRL	HVIS-4-1	AD-244475
263	KINEKE J H JR	1961	BRL	HVIS-5-1-2 N62-16566	
266	KINEKE J H RICHARDS L G	1963	BRL	HVIS-6-2-2	AD-423064
267	KINEKE J H JR VITALI R	1963	HRL	HVIS-6-2-2	AD-423064
163	KINSLOW R	1963	ARO	AEDC-TDR-63-197	AD-421578
1006	KINSLOW R	1964	ARO	AEDC-TDR-64-049	
1007	KINSLOW R	1965	ARO	INT SCI TECH 40(APRIL)	
1008	KINSLOW R	1967	ARO	AIAA-P-67-140	
1034	KLAHR C N	1965	FUND METH ASS	HVIS-7-6	AD-463232
1207	KOLSKY H	1958		APPL MECH REV 11-9 465-468	
1206	KOLSKY H	1953	IMP CHEM INDS	OXFORD U PRESS LONDON	
1024	KOLSKY H	1966	BROWN U	A66-42268	
1223	KORMER S B ET AL	1962	USSR SOV PHYS	JETP 15-3 477-488	
21	KORNHAUSER J	1958	GE-PHILA	HVIS-3-1	AD-233487
1053	KORNHAUSER M	1964		SPARTAN BKS INC BALTIMORE MD	
604	KRAUS H	1963	UA-PW-CN	HVIS-6-3	AD-423802
1001	KREYENHAGEN K N ZERNOW	1961	AEROJ	HVIS-5-1-2 N62-16578	
1148	KREYENHAGEN K N ET AL	1965	SHOCK HYDRO	HVIS-7-3	AD-463229
1224	KRUPNIKOV K K ET AL	1962	USSR SOV PHYS	JETP 15-3 470-476	
1239	KRUSZEWSKI E T HAYDUK R	1967	NASA-LANGLEY	A67-23700	
1083	KSANDER Y	1966	ATD-LIB CONG	REP-66-45	AD-635477
1005	KYLE P E GERARD G	1965	ARA	HVIS-7-5	AD-463231
1203	LECOMTE C L SCHALL R	1966	INST FR-AL RES ST-LOUIS	FRANCE	
1247	LEE T W	1964	ATL(UTAH RDC)	TDR-64-24	AD-445704
626	LEE T ET AL	1961	UTAH RDC	HVIS-5-1-2 N62-16574	
1244	LESSELLS J M	1954			
1113	LIEBLEIN S ET AL	1964	NASA-LEWIS	TN-D-2472	
1025	LIFSHITZ J M KOLSKY H	1965	BROWN U J MECH PHYS SOLIDS	13-6 361-376	
1225	LIVANOV L B	1965	USSR COSMIC RES	3-4 529-530	
1023	LUNDBERG J F ET AL	1966	BOEING-SEA J SPACECRAFT	3-2 182-187	
481	LUTTRELL J L	1963	NOL	HVIS-6-2-1	AD-423063
1245	LYSAGHT V E	1949			
448	MACCORMACK R W	1963	NASA-AMES	HVIS-6-2-2	AD-423064
404	MAIDEN C J	1963	GM-SB	TR-63-203 N63-16482	AD-406169
407	MAIDEN C J	1963	GM-SB	HVIS-6-3	AD-423802
1241	MAIDEN C J McMILLAN A R	1964	GM-SB	AIAA J 2-11 1992-1998	
12	MAIDEN C J ET AL	1960	CARDE	HVIS-4-3	AD-244477
406	MAIDEN C J ET AL	1963	GM-SB	TR-63-201	AD-404837
1070	MAIDEN C J ET AL	1963	GM-SB	TR-63-208 A64-13304	AD-404274
1071	MAIDEN C J ET AL	1965	GM-SB	HVIS-7-4	AD-463230
1157	MARNELL P ET AL	1965	TECHNIK	HVIS-7-3	AD-463229
19	MAURER W C RINEHART J S	1960	COL SCH MINES	HVIS-4-3	AD-244477
1143	MCCLOSKEY D J	1964	RAND	RM-3905-PR	AD-429196
57	MCKENZIE R J ET AL	1958	RHEEM	HVIS-3-1	AD-233487
1010	MCMATH R R	1966	AVCO-LOWELL	CR-65375 N66-27310	
408	MCMILLAN A R	1963	GM-SB	HVIS-6-3	AD-423802
1238	MCMILLAN A R	1966	GM-SB	TR-66-67	
1072	MCMILLAN A R ET AL	1966	NASA-LEWIS	TN-D-3512	
148	MCQUEEN R G MARSH S P	1960	LASL J APPL PHYS	31-7 1253-1269	
1073	MEYERS C L ET AL	1964	GM-SB	TR-64-48 N65-33856	AD-463231
1080	MOBLEY C E POND R B	1965	J HOPKINS U	HVIS-7-5	
446	MOORE H J ET AL	1961	GEOL SURV	HVIS-5-1-2 N62-16579	
451	MOORE H J ET AL	1963	GEOL SURVEY	HVIS-6-2-2	AD-423064
1074	MOORE H J ET AL	1965	GEOL SURV	HVIS-7-4	AD-463230
1114	MORSE C R STEPKA F S	1966	NASA-LEWIS	TN-D-3627	
171	MORTENSEN R B ET AL	1963	AEROJ	HVIS-6-3	AD-423802
1208	MOTT B W	1956		BOOK	
1226	MUKHAMEDZHANOV A K	1966	USSR COSMIC RESEARCH	4-2	AD-640326
1151	NAAR J	1964	SRI	DASA-1285-1	

1234	NAUMANN R J	1965	NASA-MARSHALL	HVIS-7-4	AD-463230
1160	NORDYKE M D (ED)	1961	UCRL	UCRL-6438	
1101	NYSMITH C R DENARDO B P	1966	NASA-AMES	TN-D-3304	
33	NYSMITH C R SUMMERS J L	1961	NASA-AMES	TN-D-1039	
447	NYSMITH C R SUMMERS J L	1962	NASA-AMES	TN-D-1431 N62-16839	
449	NYSMITH C R ET AL	1964	NASA-AMES	TN-D-1981	
1209	O'NEILL H	1934	VICTORIA U	BOOK	
24	OLSHAKER A E	1960	MIT	J APPL PHYS 31-12 2118-2120	
578	OLSHAKER A E BJORK R L	1961	RAND	HVIS-5-1-1 N62-16558	
1144	OLSHAKER A E BJORK R L	1961	RAND	HVIS-5-1-1 N62-16559	
1166	PALMER E P TURNER G H	1965	UTAH RDC	HVIS-7-5	AD-463231
82	PALMER E P ET AL	1960	U UTAH	HVIS-4-1	AD-244475
69	PARTRIDGE W S	1958	U UTAH	HVIS-2-1	AD-201902
75	PARTRIDGE W S ET AL	1958	UTAH RDC	HVIS-3-1	AD-233487
1009	PAYNE J J	1965	ARO	AEDC-TR-65-034 N65-16964	AD-456391
1124	PIACESI R ET AL	1964	NOL	AIAA J 2-11 2040-2042	
1125	PIACESI R ET AL	1965	NOL	HVIS-7-5	AD-463231
1126	PIACESI R ET AL	1966	NOL	TR-66-42	AD-641874
1084	PINDY F V	1966	ATD-LIB CONG	REP-66-60	AD-647408
1161	PITEK M T HAMMITT F G	1966	U MICHIGAN	08153-1-T	AD-803278
421	POND R B ET AL	1963	JOHN HOPKINS	HVIS-6-2-2	AD-423064
1129	POSEVER F C SCULLY C N	1964	FDL(NAA-DOWNEY)	TRD-64-96	AD-602512
1130	POSEVER F C ET AL	1965	NAA-DOWNEY	J SPACECRAFT 2-5 738-741	
1027	RAE W J	1965	CORNELL AER L	HVIS-7-4	AD-463230
341	RAE W J KIRCHNER H P	1963	CAL	HVIS-6-2-1	AD-423063
1227	RAYZER YU P	1964	USSR METEORITIKA	24 82-86	AD-614018
1091	REISMANN H ET AL	1964	MARTIN-DENV	CR-64-5	
411	REYNOLDS B W EMMONS R H	1963	GOODYR	HVIS-6-3	AD-423802
1145	RIEDER Z	1959	AFSWC(REPUBLIC)	TM-60-3	AD-606342
93	RINEHART J S PEARSON J	1954	NOTS	BOOK	
381	RINEY T D	1963	GE-PHILA	HVIS-6-2-1	AD-423063
1054	RINEY T D	1963	GE-PHILA	A66-31996	
1055	RINEY T D	1964	GE-PHILA	ATL-TDR-64-8	
1056	RINEY T D	1965	GE-PHILA	AIAA J 3-1 52-60	
372	RINEY T D CHERNOFF P R	1961	GE-PHILA	HVIS-5-1-1 N62-16556	
1240	RINEY T D HALDA E J	1967	GE-PHILA	A67-23716	
1057	RINEY T D HEYDA J F	1964	GE-PHILA	ATL-TR-64-64	AD-446745
1058	RINEY T D HEYDA J F	1965	GE-PHILA	HVIS-7-2	AD-463228
1059	RINEY T D ET AL	1966	GE-PHILA	AFATL-TR-66-71	AD-488138
219	ROCKOWITZ M ET AL	1961	AVCO-WIL	HVIS-5-1-2 N62-16573	
1155	ROLSTEN R F	1965	TECH OPS	AIAA J 3-11 2149-2151	
1043	ROLSTEN R F HUNT H H	1963	GD/ASTRO	AIAA J 1-8 1893-1895	
1044	ROLSTEN R F HUNT H H	1963	CALIF WEST U ASTRO AEROSP ENGR	1-10 20-24	
1045	ROLSTEN R F HUNT H H	1964	CALIF WEST U J SPACECRAFT	1-3 351-352	
1046	ROLSTEN R F SCHMITT R	1963	CALIF WEST U J APPL PHYS	34-10 3010-3012	
1047	ROLSTEN R F ET AL	1964	CALIF WEST U J APPL PHYS	35-3-1 556-559	
1048	ROLSTEN R F ET AL	1964	CALIF WEST U J APPL PHYS	35-5 1655-1656	
1156	ROLSTEN R F ET AL	1966	NATURE	212-5061 495-497	
1131	ROSEN F D SCULLY C N	1965	NAA-DOWNEY	HVIS-7-6	AD-463232
1228	RUSAKOV M M	1966	USSR PMTF JULY-AUG	A66-42886	
1229	SADOVSKIY M A ET AL	1966	USSR SOVIET PHYS-DOKLADY	11-4 293-298	
1230	SAGOMONYAN A YA	1964	USSR SOVIET PHYSICS-DOKLADY	9-6 449-452	
433	SANDORFF P E	1963	LOCKHEED MSC	HVIS-6-3	AD-423802
1152	SAUER F M ET AL	1964	SRI	DASA-1285-4	
597	SCHERRER V E	1962	ASD(TECH OPS)	TDR-62-762	AD-286915
220	SCHIPPER J F	1961	AVCO-WIL	HVIS-5-1-1 N62-16561	
1103	SCHMIDT R A ET AL	1965	NASA-AMES	HVIS-7-5	AD-463231
1175	SHEWMON P G ZACKAY V F	1961		INTERSCIENCE PUBLISHERS N Y	
1158	SLATTERY J C	1966	TRW	03246-6001-R000 N67-16639	
23	SLATTERY R E CLAY W G	1960	MIT-LL	HVIS-4-3	AD-244477

207	SMITH F EF AL	1961	ARDE	HVIS-5-1-2 N62-16570
1210	SNEDDON I N HILL R (ED)	1960	BOOK	
1167	SORENSEN N R	1965	UTAH RDC	HVIS-7-6 AD-463232
134	STANYUKOVICH K P	1959	USSR SOVIET PHYSICS JETP 36(9)-5	1141
605	STANYUKOVICH K P	1960	USSR ARTIFICIAL EARTH SATELLITES 4	86-117
133	STANYUKOVICH FEYNSKII	1947	USSR DOKLADY ACAD SCI SSSR 57-2	AD-124240
1115	STEPKA F S	1966	NASA-LEWIS	TN-D-3456
1116	STEPKA F S MORSE C R	1963	NASA-LEWIS	TN-D-1537
1117	STEPKA F S ET AL	1965	NASA-LEWIS	TN-D-3143
1118	STEPKA F S ET AL	1965	NASA-LEWIS	HVIS-7-6 AD-463232
434	STERBENTZ W H LONG L L	1963	LOCKHEED MSC	HVIS-6-3 AD-423802
1086	STRUMER P R	1963	LOCKHEED-MSC	SB-63-31 AD-419449
30	SUMMERS J L	1959	NASA-AMES	TN-D-0094
1104	SUMMERS J L	1966	NASA-AMES	
27	SUMMERS J L CHARTERS A	1958	NASA-AMES	HVIS-3-1 AD-233487
31	SUMMERS J L NIEHAUS W R	1959	NASA-AMES	TN-D-0137
1038	TEICHMANN T	1965	GEN ATOMIC	GAMD-6501 AD-620193
1106	THOMSON R G	1965	NASA-LANGLEY	TR-R-221
1107	THOMSON R G KRUSZEWSKI	1965	NASA-LANGLEY	HVIS-7-5 AD-463231
1039	TILLOTSON J H	1962	GEN ATOMIC	GA-3216 AD-486711
1108	TIPPENS P E DAVIDSON J	1966	NASA-LANGLEY	TN-D-3631
76	VANFLEET H B ET AL	1958	U UTAH	HVIS-3-1 AD-233487
1019	VITALI R ET AL	1961	BRL	HVIS-5-1-2 N62-16577
1231	VITMAN F F STEPANOV V A	1959	USSR	FTD-MT-64-217 AD-605234
1232	VITMAN F F ZLATIN N A	1964	USSR SOVIET PHYS-TECH PHYS	8-8 730-735
1002	WAGNER M H ET AL	1962	AFSWC(AEROJ)TDR-62-66-1	AD-286345
1149	WAGNER M H ET AL	1965	SHOCK HYDRO	HVIS-7-3 AD-463229
1029	WALL J K	1964	DOUGLAS-SM	AIAA J 2-7 1242-1246
1040	WALSH J M JOHNSON W E	1965	GEN ATOMIC	HVIS-7-2 AD-463228
1088	WALSH J M RICE M H	1957	LASL J CHEM PHYS	26-4 815-823
365	WALSH J M TILLOTSON J H	1963	GEN ATOMIC	GA-3827 N63-14302
141	WALSH J M ET AL	1957	LASL PHYS REV	108-2 196-216
1041	WALSH J M ET AL	1966	GEN ATOMIC	
323	WATSON R W	1961	CARNEGIE	HVIS-5-1-2 N62-16576
574	WATSON R W ET AL	1963	BUR MINES	HVIS-6-3 AD-423802
1176	WESTBROOK J H	1953	GE-SCH	TRANS ASM 45 221-248
430	WILKINS M L GIROUX R	1963	UCRL	UCRL-7271
1162	YUAN S W BLOOM A M	1964	U TEXAS	AIAA J 2-9 1667-1669
1163	YUAN S W BLOOM A M	1965	U TEXAS	AIAA J 3-7 1373-1374
1164	YUAN S W COURTER R W	1965	U TEXAS	HVIS-7-3 AD-463229
119	ZAID M	1960	TECHNIK	HVIS-4-3 AD-244477
600	ZAID M	1961	TECHNIK	HVIS-5-1-1 N62-16560
1077	ZAKER T A	1965	IITRI	AIAA J 3-7 1372-1373
1233	ZEL'DOVICH YA B ET AL	1959	USSR Sov Phys Doklady 3	938-939
1003	ZERNOW L	1963	AEROJ	HVIS-6-3 AD-423802
1089	ZUKAS E G	1966	LASL METALS ENGR QUAR	6-2 1-20

APPENDIX D

ABBREVIATED BIBLIOGRAPHIC LISTINGS
ARRANGED IN NUMERICAL ORDER

2 GEHRING J W JR	1958	BRL	HVIS-3-1	AD-233487
3 KINEKE J H JR	1958	BRL	HVIS-3-1	AD-233487
4 FELDMAN J B JR	1958	BRL	HVIS-3-1	AD-233487
5 KINEKE J H JR	1960	BRL	HVIS-4-1	AD-244475
6 FELDMAN J B JR	1960	BRL	HVIS-4-2	AD-244476
7 GEHRING J W JR	1960	BRL	HVIS-4-2	AD-244476
8 GEHRING J W RICHARDS L	1960	BRL	HVIS-4-3	AD-244477
9 GLASS C M POND R B	1960	BRL	HVIS-4-3	AD-244477
12 MAIDEN C J ET AL	1960	CARDE	HVIS-4-3	AD-244477
16 ALLISON F E BRYAN G M	1957	CARNEGIE	HVIS-2-1	AD-201902
18 ALLISON F E ET AL	1960	CARNEGIE	HVIS-4-1	AD-244475
19 MAURER W C RINEHART J S	1960	COL SCH MINES	HVIS-4-3	AD-244477
21 KORNHAUSER M	1958	GE-PHILA	HVIS-3-1	AD-233487
23 SLATTERY R E CLAY W G	1960	MIT-LL	HVIS-4-3	AD-244477
24 OLSHAKER A E	1960	MIT	J APPL PHYS 31-12 2118-2120	
28 CHARTERS A C LOCKE G S	1958	NACA-AMES	RM-A58B26	
29 CHARTERS A C SUMMERS J	1960	NOL(NASA-AMES)	NOLR-1238	
32 CHARTERS A C	1960	NASA-AMES	SCI AMER 203-10 128-140	
33 NYSMITH C R SUMMERS J L	1961	NASA-AMES	TN-D-1039	
34 KINARD W H ET AL	1958	NASA-LAN	MEMO-10-18-58L	
35 COLLINS R D KINARD W H	1960	NASA-LANGLEY	TN-D-0238	
38 KINARD W H COLLINS R D	1961	NASA-LANGLEY	TN-D-0726	
39 FUNKHOUSER J O	1961	NASA-LANGLEY	TN-D-0802	
50 ATKINS W W	1958	NRL	HVIS-3-1	AD-233487
51 ATKINS W W	1960	NRL	HVIS-4-1	AD-244475
55 CLARK E N ET AL	1960	PICATINNY AR	HVIS-4-1	AD-244475
56 FRIICHENICHT HAMMERMESH	1960	TRW	HVIS-4-3	AD-244477
57 MCKENZIE R J ET AL	1958	RHEEM	HVIS-3-1	AD-233487
60 ANDERSON G D ET AL	1958	SRI-PL	HVIS-3-1	AD-233487
69 PARTRIDGE W S	1958	U UTAH	HVIS-2-1	AD-201902
75 PARTRIDGE W S ET AL	1958	U UTAH	HVIS-3-1	AD-233487
77 COOK M A KEYES R T	1958	U UTAH	HVIS-3-1	AD-233487
81 KEYES R T ET AL	1960	U UTAH	HVIS-4-3	AD-244477
82 PALMER E P ET AL	1960	U UTAH	HVIS-4-1	AD-244475
83 GROW R W ET AL	1960	U UTAH	HVIS-4-3	AD-244477
89 ABBOT K H	1960	WATERTOWN AR	HVIS-4-2	AD-244476
93 RINEHART J S PEARSON J	1954	NOTS	BOOK	
103 HOPKINS H G KOLSKY H	1960	ARDE	HVIS-4-1	AD-244475
115 ALLISON F E	1958	CARNEGIE	HVIS-3-1	AD-233487
128 BJORK R L	1958	RAND	P-1662	AD-224147
136 BRYAN G M	1960	CARNEGIE	HVIS-4-3	AD-244477
144 ALLEN W A ET AL	1958	NOTS	HVIS-3-1	AD-233487
148 MCQUEEN R G MARSH S P	1960	LASL	J APPL PHYS 31-7 1253-1269	
152 BJORK R L	1961	RAND	J GEOPHY RES 66-10 3379-3387	
164 GOODMAN E H LILES C D	1963	ARO	HVIS-6-2-2	AD-423064
171 MORTENSEN R B ET AL	1963	AEROJ	HVIS-6-3	AD-423802
204 FUGELSO L E	1961	AMF	HVIS-5-1-1 N62-16557	
205 JAMES H J BUCHANAN J S	1958	BRIT JSM	HVIS-3-1	AD-233487

207	SMITH F ET AL	1961	ARDE	HVIS-5-1-2	N62-16570	
210	HOENIG S A RITTER A	1957	ARMOUR	HVIS-2-1		AD-201902
219	ROCKOWITZ M ET AL	1961	AVCO-WIL	HVIS-5-1-2	N62-16573	
220	SCHIPPER J F	1961	AVCO-WIL	HVIS-5-1-1	N62-16561	
263	KINEKE J H JR	1961	BRL	HVIS-5-1-2	N62-16566	
264	FRASIER J T KARPOV B G	1961	BROWN U	HVIS-5-1-2	N62-16567	
266	KINEKE J H RICHARDS L G	1963	BRL	HVIS-6-2-2		AD-423064
267	KINEKE J H JR VITALI R	1963	BRL	HVIS-6-2-2		AD-423064
323	WATSON R W	1961	CARNEGIE	HVIS-5-1-2	N62-16576	
341	RAE W J KIRCHNER H P	1963	CAL	HVIS-6-2-1		AD-423063
350	CHOU P C	1961	DREXEL	HVIS-5-1-1	N62-16563	
365	WALSH J M TILLUTSON J H	1963	GEN ATOMIC	GA-3827	N63-14302	
372	RINEY T D CHERNOFF P R	1961	GE-PHILA	HVIS-5-1-1	N62-16556	
376	BRUCE E P	1961	GE-PHILA	HVIS-5-1-2	N62-16569	AD-600668
381	RINEY T D	1963	GE-PHILA	HVIS-6-2-1		AD-423063
382	HEYDA J F	1963	GE-PHILA	HVIS-6-2-1		AD-423063
404	MAIDEN C J	1963	GM-SB	TR-63-203	N63-16482	AD-406169
406	MAIDEN C J ET AL	1963	GM-SB	TR-63-201		AD-404837
407	MAIDEN C J	1963	GM-SB	HVIS-6-3		AD-423802
408	MCMILLAN A R	1963	GM-SB	HVIS-6-3		AD-423802
411	REYNOLDS B W EMMONS R H	1963	GOODYR	HVIS-6-3		AD-423802
421	POND R B ET AL	1963	JOHN HOPKINS	HVIS-6-2-2		AD-423064
430	WILKINS M L GIROUX R	1963	UCRL	UCRL-7271		
433	SANDURFF P E	1963	LOCKHEED MSC	HVIS-6-3		AD-423802
434	STERBENTZ W H LONG L L	1963	LOCKHEED MSC	HVIS-6-3		AD-423802
437	HERRMANN W JONES A H	1961	MIT	HVIS-5-1-2	N62-16568	
438	HERRMANN W JONES A H	1961	MIT	ASRL-R-99-1		AD-267289
440	HERRMANN W JONES A H	1963	ASD(MIT)	TDR-63-140		AD-408777
441	ENGEL O G	1963	HVIS-6-2-2			AD-423064
445	DENARDO B P	1962	NASA-AMES	TN-D-1210		AD-273315
446	MOORE H J ET AL	1961	GEOL SURV	HVIS-5-1-2	N62-16579	
447	NYSMITH C R SUMMERS J L	1962	NASA-AMES	TN-D-1431	N62-16839	
448	MACCORMACK R W	1963	NASA-AMES	HVIS-6-2-2		AD-423064
449	NYSMITH C R ET AL	1964	NASA-AMES	TN-D-1981		
450	GAULT D E HEITOWIT E D	1963	NASA-AMES	HVIS-6-2-2		AD-423064
451	MOORE H J ET AL	1963	GEOL SURVEY	HVIS-6-2-2		AD-423064
454	ALEXANDER W M BERG O E	1961	NASA-GODDARD	HVIS-5-1-2	N62-16580	
457	GAYLE J B ET AL	1963	NASA-MARSHALL	TMX-56505	N65-25011	
461	HUMES D ET AL	1961	NASA-LANGLEY	HVIS-5-1-2	N62-16575	
463	DAVIDSON J R ET AL	1963	NASA-LANGLEY	TN-D-1493		
465	HUMES D H	1963	NASA-LANGLEY	TN-D-1784		
481	LUTTRELL J L	1963	NOL	HVIS-6-2-1		AD-423063
510	HALPERSON S M ATKINS W	1961	NRL	HVIS-5-1-2	N62-16571	
514	HALPERSON S M	1963	NRL	HVIS-6-2-2		AD-423064
540	D'ANNA P J	1963	NORTHROP-HAW	HVIS-6-3	N63-15390	AD-423802
545	DAVIUS N ET AL	1961	PENN STATE U	HVIS-5-1-1	N62-16555	
547	DAVIUS N ET AL	1963	PENN STATE U	HVIS-6-2-1		AD-423063
574	WATSON R W ET AL	1963	BUR MINES	HVIS-6-3		AD-423802
576	BJORK R L GAZLEY C JR	1959	RAND	RM-2332		
578	OLSHAKER A E BJORK R L	1961	RAND	HVIS-5-1-1	N62-16558	
580	BJORK R L	1963	RAND	RM-3529-PR	N63-19789	
582	BJORK R L	1958	RAND	S-103		AD-305657
588	FRIICHTENICHT J SLATTERY	1963	TRW-STL	HVIS-6-2-2		AD-423064
597	SCHERRER V E	1962	ASD(TECH OPS)	TDR-62-762		AD-286915
600	ZAID M	1961	TECHNIK	HVIS-5-1-1	N62-16560	
604	KRAUS H	1963	UA-PW-CN	HVIS-6-3		AD-423802
605	STANYUKOVICH K P	1960	USSR ARTIFICIAL EARTH SATELLITES	4 86-117		
626	LEE T ET AL	1961	UTAH RDC	HVIS-5-1-2	N62-16574	
628	FYFE I M	1961	BOEING-SEA	HVIS-5-1-1	N62-16562	

635	FUCHS O P	1963	TEMPLE U	AIAA J 1-9	2124-2126	
1001	KREYENHAGEN K N	ZERNOW	1961	AEROJ	HVIS-5-1-2	N62-16578
1002	WAGNER M H	ET AL	1962	AFSWC(AEROJ)	TDR-62-66-1	AD-286345
1003	ZERNOW L		1963	AEROJ	HVIS-6-3	AD-423802
1004	GERARD G	KYLE P E	1965	ARA	ARA-65-3	
1005	KYLE P E	GERARD G	1965	ARA	HVIS-7-5	AD-463231
1006	KINSLAW R		1964	ARO	AEDC-TDR-64-049	
1007	KINSLAW R		1965	ARO	INT SCI TECH 40(APRIL)	
1008	KINSLAW R		1967	ARO	AIAA-P-67-140	
1009	PAYNE J J		1965	ARO	AEDC-TR-65-034	N65-16964
1010	MCMATH R R		1966	AVCO-LOWELL	CR-65375	N66-27310
1011	ALLISON F E		1961	BRL	HVIS-5-1-1	N62-16553
1012	ALLISON F E		1965	BRL	HVIS-7-5	AD-463231
1013	EICHELBERGER R J		1958	BRL	HVIS-3-1	AD-233487
1014	EICHELBERGER R J		1961	BRL	HVIS-5-1-2	N62-16564
1015	EICHELBERGER R J		1961	BRL	HVIS-5-1-2	N62-16565
1016	EICHELBERGER R J		1963	BRL	HVIS-6-2-2	AD-423064
1017	EICHELBERGER R	GEHRING	1962	BRL	ARS J 32-10	1583-1590
1018	FRASIER J T	ET AL	1965	BRL	HVIS-7-5	AD-463231
1019	VITALI R	ET AL	1961	BRL	HVIS-5-1-2	N62-16577
1020	BERT C W	ET AL	1963	BATTELLE	BAT-197-16-1	AD-408386
1021	GIDEON D N	ET AL	1965	BATTELLE	BAT-197-21-2(REV 1)	AD-463372
1022	HAN L S	HESS R E	1965	BATTELLE	HVIS-7-4	AD-463230
1023	LUNDBERG J F	ET AL	1966	BOEING-SEA	J SPACECRAFT 3-2	182-187
1024	KOLSKY H		1966	BROWN U	A66-42268	
1025	LIFSHITZ J M	KOLSKY H	1965	BROWN U	J MECH PHYS SOLIDS 13-6	361-376
1026	BRYAN G M		1961	CARNEGIE	HVIS-5-1-2	N62-16572
1027	RAE W J		1965	CORNELL AER L	HVIS-7-4	AD-463230
1028	FERGUSON C W		1966	DOUGLAS	SM-52027	N66-22267
1029	WALL J K		1964	DOUGLAS-SM	AIAA J 2-7	1242-1246
1030	CHOU P C	ALLISON F E	1966	DREXEL INST	J APPL PHYS 37-2	853-860
1031	CHOU P C	BURNS B P	1967	DREXEL INST	J APPL PHYS 38-2	553-560
1032	CHOU P C	ET AL	1963	DREXEL INST	DIT-R-160-1 CR 50249	
1033	CHOU P C	ET AL	1965	DREXEL INST	HVIS-7-2	AD-463228
1034	KLAHR C N		1965	FUND METH ASS	HVIS-7-6	AD-463232
1035	EHRENFIELD J	ET AL	1966	GCA J APPL PHYS	37-13	4737-4738
1036	DIENES J K		1965	GEN ATOMIC	HVIS-7-2(GA 5755)	AD-463228
1037	DIENES J K	ET AL	1965	GEN ATOMIC	GA-6509	AD-617540
1038	TEICHMANN T		1965	GEN ATOMIC	GAMD-6501	AD-620193
1039	TILLOTSON J H		1962	GEN ATOMIC	GA-3216	AD-486711
1040	WALSH J M	JOHNSON W E	1965	GEN ATOMIC	HVIS-7-2	AD-463228
1041	WALSH J M	ET AL	1966	GEN ATOMIC		
1042	ALI A		1963	GD/ASTRO	ERR-AN-167	
1043	ROLSTEN R F	HUNT H H	1963	GD/ASTRO	AIAA J 1-8	1893-1895
1044	ROLSTEN R F	HUNT H H	1963	CALIF WEST U	ASTRO AEROSP ENGR 1-10	20-24
1045	ROLSTEN R F	HUNT H H	1964	CALIF WEST U	J SPACECRAFT 1-3	351-352
1046	ROLSTEN R F	SCHMITT R	1963	CALIF WEST U	J APPL PHYS 34-10	3010-3012
1047	ROLSTEN R F	ET AL	1964	CALIF WEST U	J APPL PHYS 35-3-1	556-559
1048	ROLSTEN R F	ET AL	1964	CALIF WEST U	J APPL PHYS 35-5	1655-1656
1049	BRUCE E P		1965	GE-PHILA	HVIS-7-6	AD-463232
1050	HEYDA J F	RINEY T D	1964	GE-PHILA	R64SD87	AD-452991
1051	HEYDA J F	RINEY T D	1965	GE-PHILA	ATL-TR-65-26	N65-23644
1052	HEYDA J F	RINEY T D	1966	GE-PHILA	CR-609	AD-461267
1053	KORNHAUSER M		1964	GE-PHILA	SPARTAN BKS INC	BALTIMORE MD
1054	RINEY T D		1963	GE-PHILA	A66-31996	
1055	RINEY T D		1964	GE-PHILA	ATL-TDR-64-8	
1056	RINEY T D		1965	GE-PHILA	AIAA J 3-1	52-60
1057	RINEY T D	HEYDA J F	1964	GE-PHILA	ATL-TR-64-64	AD-446745

1058 RINEY T D	HEYDA J F	1965	GE-PHILA	HVIS-7-2	AD-463228
1059 RINEY T D	ET AL	1966	GE-PHILA	AFATL-TR-66-71	AD-488138
1060 CHAREST J A		1964	GM-SB	TR-64-58 N66-37523	
1061 CHRISTMAN D R		1966	GM-SB	AIAA J 4-10 1872-1874	
1062 CHRISTMAN D R	GEHRING J	1965	GM-SB	TR-65-04	
1063 CHRISTMAN D R	GEHRING J	1965	GM-SB	TR-65-50	
1064 CHRISTMAN D R	GEHRING J	1966	GM-SB	J APPL PHYS 37-4 1579-1587	
1065 CHRISTMAN D R	ET AL	1965	GM-SB	HVIS-7-6	AD-463232
1066 GEHRING J W	WARNICA R L	1963	GM-SB	HVIS-6-2-2	AD-423064
1067 GEHRING J W	ET AL	1965	GM-SB	HVIS-7-5	AD-463231
1068 GEHRING J W	ET AL	1965	GM-SB	J SPACECRAFT 2-5 731-737	
1069 GEHRING J W	ET AL	1965	GM-SB	ASM-TR-W-13-5-65	
1070 MAIDEN C J	ET AL	1963	GM-SB	TR-63-208 A64-13304	AD-404274
1071 MAIDEN C J	ET AL	1965	GM-SB	HVIS-7-4	AD-463230
1072 MCMILLAN A R	ET AL	1966	NASA-LEWIS	TN-D-3512	
1073 MEYERS C L	ET AL	1964	GM-SB	TR-64-48 N65-33856	
1074 MOORE H J	ET AL	1965	GEOL SURV	HVIS-7-4	AD-463230
1075 HAYES INT CORP		1963	APGC	TDR-63-22	AD-401759
1076 HAYES INT CORP		1964	ATL	TDR-64-51	AD-447004
1077 ZAKER T A		1965	IITRI	AIAA J 3-7 1372-1373	
1078 DIETRICH A M	ET AL	1965	J HOPKINS U	HVIS-7-5	AD-463231
1079 FITZGERALD E R		1966	JOHN HOPKINS U		
1080 MOBLEY C E	POND R B	1965	J. HOPKINS U	HVIS-7-5	AD-463231
1081 ANON		1964	ATD-LIB CONGR	AID P-64-44	AD-602358
1082 ANON		1965	ATD-LIB CONGR	P-65-1	AD-610054
1083 KSANDER Y		1966	ATD-LIB CONG	REP-66-45	AD-635477
1084 PINDY F V		1966	ATD-LIB CONG	REP-66-60	AD-647408
1085 GRAZIANO E	MCCORMICK H	1963	LOCKHEED-MSC	SB-63-58	AD-431973
1086 STROMER P R		1963	LOCKHEED-MSC	SB-63-31	AD-419449
1087 AMSDEN A A		1966	LASL	LA-3466 N67-10529	
1088 WALSH J M	RICE M H	1957	LASL	J CHEM PHYS 26-4 815-823	
1089 ZUKAS E G		1966	LASL	METALS ENGR QUAR 6-2 1-20	
1090 BOUMA D D	BURKITT W C	1966	MARTIN-DENV	CR-664	
1091 REISMANN H	ET AL	1964	MARTIN-DENV	CR-64-5	
1092 HERRMANN W	JONES A H	1961	MIT	ASRL-R-99-1-A	AD-267290
1093 HERRMANN W	ET AL	1962	ASD(MIT)	TDR-62-399	AD-288885
1094 HERMANN W	ET AL	1963	AFSWC(MIT)	TDR-63-12	AD-410386
1095 JONES A H	ET AL	1963	MIT	ASRL-R-99-2	AD-432815
1097 DENARDO B P		1966	NASA-AMES	TN-D-3369	
1098 DENARDO B P	NYSMITH C R	1966	NASA-AMES		
1099 FISH R H	SUMMERS J L	1965	NASA-AMES	HVIS-7-6 N65-29392	AD-463232
1100 GAULT D E	MOORE H J	1965	NASA-AMES	HVIS-7-6	AD-463232
1101 NYSMITH C R	DENARDO B P	1966	NASA-AMES	TN-D-3304	
1103 SCHMIDT R A	ET AL	1965	NASA-AMES	HVIS-7-5	AD-463231
1104 SUMMERS J L		1966	NASA-AMES		
1105 DI BATTISTA J D		1966	NASA-LANGLEY	TN-D-3618	
1106 THOMSON R G		1965	NASA-LANGLEY	TR-R-221	
1107 THOMSON R G	KRUSZEWSKI	1965	NASA-LANGLEY	HVIS-7-5	AD-463231
1108 TIPPENS P E	DAVIDSON J	1966	NASA-LANGLEY	TN-D-3631	
1109 CLOUGH N	ET AL	1966	NASA-LEWIS	TN-D-3468	
1110 DIEDRICH J H	STEPKA F S	1965	NASA-LEWIS	TN-D-2720	
1111 DIEDRICH J H	ET AL	1965	NASA-LEWIS	TN-D-3018 N65-33838	
1112 DIEDRICH J H	ET AL	1965	NASA-LEWIS	HVIS-7-6	AD-463232
1113 LIEBLEIN S	ET AL	1964	NASA-LEWIS	TN-D-2472	
1114 MORSE C R	STEPKA F S	1966	NASA-LEWIS	TN-D-3627	
1115 STEPKA F S		1966	NASA-LEWIS	TN-D-3456	
1116 STEPKA F S	MORSE C R	1963	NASA-LEWIS	TN-D-1537	
1117 STEPKA F S	ET AL	1965	NASA-LEWIS	TN-D-3143	

1118	STEPKA F S	ET AL	1965	NASA-LEWIS	HVIS-7-6	AD-463232
1119	DALTON C C		1964	NASA-MARSHALL	TN-D-1996	
1120	DALTON C C		1966	NASA-MARSHALL	TMX-53512 N66-38943	
1121	ENGEL O G		1962	WADD(NBS)	TR-60-475-2	AD-408984
1122	ENGEL O G		1966	WADD(NBS)	TR-60-475-2-1	AU-641302
1123	ENGEL O G		1966	WADD(NBS)	TR-60-475-3	AU-643237
1124	PIACESI R	ET AL	1964	NOL	AIAA J 2-11 2040-2042	
1125	PIACESI R	ET AL	1965	NOL	HVIS-7-5	AD-463231
1126	PIACESI R	ET AL	1966	NOL	TR-66-42	AD-641874
1127	HALPERSON S M		1965	NRL	HVIS-7-5	AD-463231
1128	HALPERSON S	ET AL	1960	NRL	HVIS-4-3	AD-244477
1129	POSEVER F C	SCULLY C N	1964	FDL(NAA-DOWNEY)	TRD-64-96	AD-602512
1130	POSEVER F C	ET AL	1965	NAA-DOWNEY	J SPACECRAFT 2-5 738-741	
1131	ROSEN F D	SCULLY C N	1965	NAA-DOWNEY	HVIS-7-6	AD-463232
1132	D'ANNA P J	HEITZ R M	1966	NORTHROP-HAW	CR-485	
1133	DITARANTO R A		1966	PENN MIL COL	MEL-RU-R-37-66	AD-629785
1134	DAVIDS N	(ED)	1960		BOOK	
1135	DAVIDS N	HUANG Y K	1962	PENN STATE U	J AEROSP SCI 29-5 550-557	
1136	DAVIDS N	ET AL	1965	PENN STATE U	HVIS-7-3	AD-463229
1137	BJORK R L		1962	RAND	ARS J 32-9 1471-1472	
1138	BJORK R L	OLSHAKER A E	1965A	RAND	RM-2926-PR	AD-617339
1139	BJORK R L	OLSHAKER A E	1965B	RAND	RM-3490-PR	AD-617549
1140	BJORK R L	ET AL	1963	RAND	RM-2628-PR	AD-425951
1141	BRODE H L	BJORK R L	1961	RAND	UCRL-6438	
1142	KAPLAN M A	PAPETTI R A	1966	RAND	RM-4876-PR	AD-641655
1143	MCCLOSKEY D J		1964	RAND	RM-3905-PR	AD-429196
1144	OLSHAKER A E	BJORK R L	1961	RAND	HVIS-5-1-1 N62-16559	
1145	RIEGER Z		1959	AFSWC(REPUBLIC)	TM-60-3	AD-606342
1146	BUTCHER B M	ET AL	1964	SANDIA	AIAA J 2-6 977-990	
1147	BJORK R L	ROSENBLATT M	1965	SHOCK HYDRO	HVIS-7-4	AD-463230
1148	KREYENHAGEN K N	ET AL	1965	SHOCK HYDRO	HVIS-7-3	AD-463229
1149	WAGNER M H	ET AL	1965	SHOCK HYDRO	HVIS-7-3	AD-463229
1150	DORAN D G	LINDE R K	1965	SRI POULT LAB	TR-004-65	AD-479462
1151	NAAR J		1964	SRI	DASA-1285-1	
1152	SAUER F M	ET AL	1964	SRI	DASA-1285-4	
1153	GOODIER J N		1965	STANFORD U	HVIS-7-3	AD-463229
1154	BORG S F		1966	STEVENS INST TECH	A67-11444	
1155	ROLSTEN R F		1965	TECH OPS	AIAA J 3-11 2149-2151	
1156	ROLSTEN R F	ET AL	1966		NATURE 212-5061 495-497	
1157	MARNELL P	ET AL	1965	TECHNIK	HVIS-7-3	AD-463229
1158	SLATTERY J C		1966	TRW	03246-6001-R000 N67-16639	
1159	GOLDSMITH W		1963	U CALIF BERKLEY	APPL MECH REV 16-11 855-866	
1160	NORDYKE M D	(ED)	1961	UCRL	UCRL-6438	
1161	PITEK M T	HAMMITT F G	1966	U MICHIGAN	08153-1-T	AD-803278
1162	YUAN S W	BLOOM A M	1964	U TEXAS	AIAA J 2-9 1667-1669	
1163	YUAN S W	BLOOM A M	1965	U TEXAS	AIAA J 3-7 1373-1374	
1164	YUAN S W	COURTER R W	1965	U TEXAS	HVIS-7-3	AD-463229
1165	COOK M A		1958	U UTAH	BOOK	
1166	PALMER E P	TURNER G H	1965	UTAH RDC	HVIS-7-5	AD-463231
1167	SORENSEN N R		1965	UTAH RDC	HVIS-7-6	AD-463232
1168	DUNN W P		1966	WVT	WVT-6609	AD-637136
1169	DUNN W P		1966	WVT	AIAA J 4-3 535-536	
1170	ANON		1963	ASD	TDR-63-140	AD-408777
1171	ANON		1966	AGARD		
1172	COSBY W A	LYLE R G	1965	NAS-NRC	SP-78	
1173	DAVIS D M		1963	ASD-WL-EGLIN	HVIS-6-3	AD-423802
1174	FERRY J D		1961		BOOK	
1175	SHEWMON P G	ZACKAY V F	1961		INTERSCIENCE PUBLISHERS N Y	
1176	WESTBROOK J H		1953	GE-SCH	TRANS ASM 45 221-248	
1177	HVIS-1	SECRET REPORT	1955	AFOSR		AD-079284

1176 HVIS-2-1	1957	NRL/ARDC	AD-201902
1179 HVIS-2-2 CONF REPORT	1957	NRL/ARDC	AD-301552
1180 HVIS-3-1	1959	ARF	AD-233487
1181 HVIS-3-2 SECRET REPORT	1959	ARF	AD-315486
1182 HVIS-4-1	1960	APGR	TR-60-39-1 AD-244475
1183 HVIS-4-2	1960	APGR	TR-60-39-2 AD-244476
1184 HVIS-4-3	1960	APGR	TR-60-39-3 AD-244477
1185 HVIS-4-5 SECRET REPORT	1960	APGR	TR-60-39-5 AD-321455
1186 HVIS-5-1-1	1962	COLORADO SCHOOL MINES	N62-16548
1187 HVIS-5-1-2	1962	COLORADO SCHOOL MINES	N62-16564
1188 HVIS-5-2	1962	COLORADO SCHOOL MINES	
1189 HVIS-6-1	1963	FIRESTONE-CLEVELAND	
1190 HVIS-6-2-1	1963	FIRESTONE-CLEVELAND	AD-423063
1191 HVIS-6-2-2	1963	FIRESTONE-CLEVELAND	AD-423064
1192 HVIS-6-3	1963	FIRESTONE-CLEVELAND	AD-423802
1193 HVIS-6-4 SECRET REPORT	1963	FIRESTONE-CLEVELAND	AD-345054
1194 HVIS-7-1 TECHNIQUES	1965	MARTIN-ORLANDO	AD-463227
1195 HVIS-7-2 THEORY	1965	MARTIN-ORLANDO	AD-463228
1196 HVIS-7-3 THEORY	1965	MARTIN-ORLANDO	AD-463229
1197 HVIS-7-4 THEORY	1965	MARTIN-ORLANDO	AD-463230
1198 HVIS-7-5 EXPERIMENTS	1965	MARTIN-ORLANDO	AD-463231
1199 HVIS-7-6 EXPERIMENTS	1965	MARTIN-ORLANDO	AD-463232
1200 HVIS-7-7 SECRET REPORT	1965	MARTIN-ORLANDO	AD-365243
1201 HVIS-7-8 SECRET REPORT	1965	MARTIN-ORLANDO	AD-365244
1202 BACH G C LEE J H	1967	MCGILL U AIAA-P-67-141	A67-18290
1203 LECOMTE C L SCHALL R	1966	INST FR-AL RES ST-LOUIS FRANCE	
1204 CABLE A J	1966	RARDE ENGLAND	
1205 HOPKINS H G	1961	ARDE HVIS-5-1-1	N62-16554
1206 KOLSKY H	1953	IMP CHEM INDS OXFORD U PRESS LONDON	
1207 KOLSKY H	1958	APPL MECH REV 11-9 465-468	
1208 MOTT B W	1956	BOOK	
1209 O'NEILL H	1934	VICTORIA U BOOK	
1210 SNEDDON I N HILL R (ED)	1960	BOOK	
1211 AL'TSHULER L V	1965	USSR SOV PHYS USPEKHI 8-1 52-91	
1212 AL'TSHULER L V ET AL	1959	USSR SOV PHYS DOKLADY 3 761-763	
1213 AL'TSHULER L V ET AL	1960	USSR SOV PHYS JETP 11-4 766-775	
1214 ANDRIANKIN E I	1965	USSR J APPL MECH TECH PHY 1 88-92	AD-633118
1215 ANDRIANKIN E I	1966	USSR COSMIC RESEARCH 4-2	AD-640326
1216 ANDRIANKIN E I STEPANOV	1963	USSR PLANT SPACE SCI 11-11 1365-1373	
1217 BAKANOVA A A ET AL	1965	USSR SOV PHYS SOLID STATE 7-6 1307-1313	
1218 BAUM F A ET AL	1959	USSR BOOK	AD-400151
1219 BELYAKOV L V ET AL	1964	USSR SOVIET PHYS-TECH PHYS 8-8 736-739	
1220 BELYAKOV L V ET AL	1964	USSR SOVIET PHYS-TECH PHYS 9-3 403-406	
1221 BELYAKOV L V ET AL	1965	USSR SOVIET PHYSICS-DOKLADY 10-1 69-71	
1222 GOGOLEV V M ET AL	1963	USSR J APPL MECH TECH PHY 5	AD-614773
1223 KORMER S B ET AL	1962	USSR SOV PHYS JETP 15-3 477-488	
1224 KRUPNIKOV K K ET AL	1962	USSR SOV PHYS JETP 15-3 470-476	
1225 LIVANOV L B	1965	USSR COSMIC RES 3-4 529-530	
1226 MUKHAMEDZHANOV A K	1966	USSR COSMIC RESEARCH 4-2	AD 640326
1227 RAYZER YU P	1964	USSR METEORITIKA 24 82-86	AD-614018
1228 RUSAKOV M M	1966	USSR PMTF JULY-AUG A66-42886	
1229 SADOVSKIY M A ET AL	1966	USSR SOVIET PHYS-DOKLADY 11-4 293-298	
1230 SAGOMONYAN A YA	1964	USSR SOVIET PHYSICS-DOKLADY 9-6 449-452	
1231 VITMAN F F STEPANOV V A	1959	USSR FTD-MT-64-217	AD-605234
1232 VITMAN F F ZLATIN N A	1964	USSR SOVIET PHYS-TECH PHYS 8-8 730-735	
1233 ZEL'DOVICH YA B ET AL	1959	USSR SOV PHYS DOKLADY 3 938-939	
1234 NAUMANN R J	1965	NASA-MARSHALL HVIS-7-4	AD-463230
1235 CHARTERS A C ET AL	1966	GM-SB	
1236 BRYAN G M PUGH E M	1962	CARNEGIE J APPL PHYS 33-2 734-738	

1238	MCMILLAN A R	1966	GM-SB	TR-66-67	
1239	KRUSZEWSKI E T HAYDUK R	1967	NASA-LANGLEY		A67-23700
1240	RINEY T D HALDA E J	1967	GE-PHILA		A67-23716
1241	MAIDEN C J MCMILLAN A R	1964	GM-SB	AIAA J 2-11 1992-1998	
1242	JEAN B	1966		AIAA J 4-10 1854-1856	
1243	BATSON R G HYDE J H	1931			
1244	LESSELLS J M	1954			
1245	LYSAGHT V E	1949			
1246	BELTON W L ET AL	1967	BATTELLE BAT-197A-21-2(REV 2)		AD-809916
1247	LEE T W	1964	ATL(UTAH RDC) TDR-64-24		AD-445704